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ABSTRACT

Definitions, advantages, and functions of nutrition are the starting point for this food service training manual, which includes lessons on proteins, carbohydrates, minerals, and water- and fat-soluble vitamins. Energy foods for child nutrition programs are also identified, as are balanced diets and meal pattern guidelines. Class activities, handouts (often with pictures), further references, progress tests, and appendixes complete the manual. (KS)

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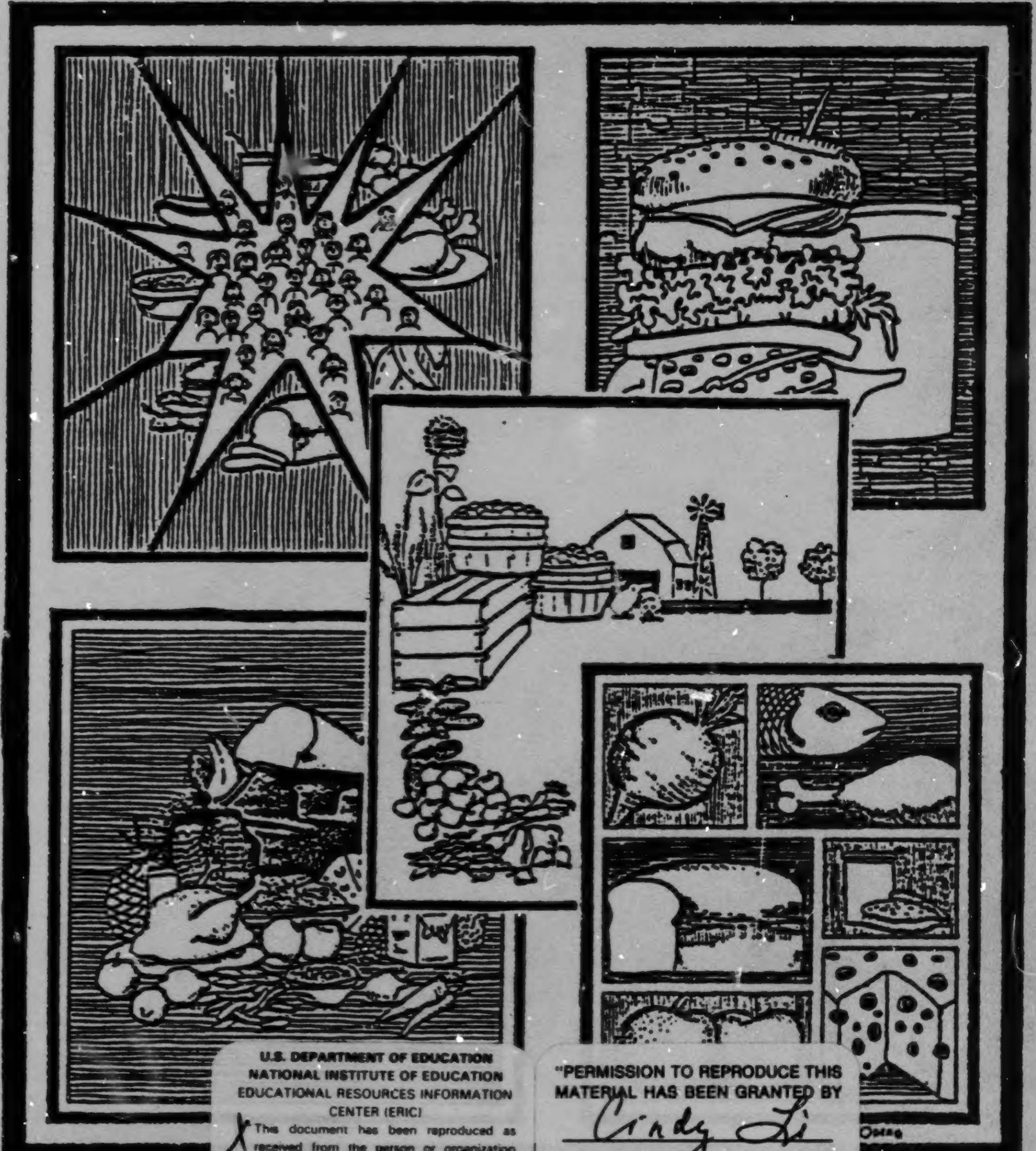
NUTRITION

Michigan School Food Service Training Manual



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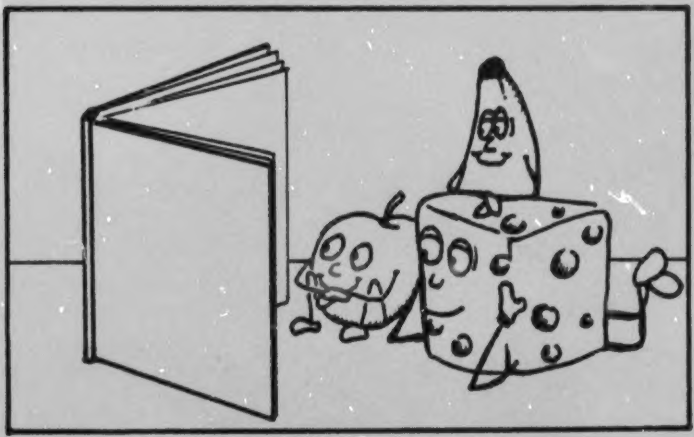


LESSON 1 BACKGROUND OF BASIC NUTRITION CONCEPTS

A. Goal of this lesson

The goal of this lesson is to introduce the participant to the topic of nutrition, to provide background information on nutrition concepts, and to provide a foundation of nutrition information for future lessons.

B. Purpose of this lesson

After completing this lesson, participants should be able to:

1. define the term "nutrition"
2. define the term "nutrients"
3. list three functions of nutrients, and
4. describe four factors that influence specific food choices and give an example of each.

C. Instructor preparation for class activities

1. Duplicate sufficient copies of handouts found at the end of the lesson.
2. Locate pictures to illustrate examples of malnutrition such as obesity, dental cavities, visual defects with vitamin A deficiency, excess fluoride (refer to reference list, poster series by David F. Newton);
3. Prepare and collect samples of foods that have been altered so they do not look like we usually see them (see list on page 8).
4. Begin to collect food labels for use in following lessons.
5. Select film from suggested list (optional):

Nutrition Is... The Sugar Association, 1511 K St. N.W., Washington, DC 20005. (202) 628-0189 (25 min., 16 mm., color, Purchase: $120.00 Descriptors: Nutrition, foods, nutrition educations, health. Available from FNIERC,*Acc. No. 410-76; also available from Michigan State University Film Library.

The Real, Talking, Singing Action Movie About Nutrition. Aims Media, Inc. 626 Justin Ave., Glendale, CA 91201. (213) 240-9300. (Cat. No. AA3497, 14 min., 16 mm., color, rental cost: $25.00, purchase: 210.00) Available from FNIERC, *Acc. No. 467-73. (Also in Spanish.)

Big Dinner Table. Perennial Education, Inc,. 477 Roger Williams, P.O. Box 855, Ravinia, Highland Park, IL 60035. (312) 433-1610 (13 min., 16 mm., color, rental: $22.00, purchase: $183.00) Descriptors: Growth, food groups, food habits, nutrition education, basic four. Available from FNIERC, *Acc. No. 1842-78.

Quality Food, Quality Choice and Nutrition Education by the Foodservice Worker. Food Science and Human Nutrition, Michigan State University, East Lansing, Michigan 48824. (20 min., 3/4" videotape, color, available from most Michigan REMC's, and State Library). Descriptors: Food service workers, food habits, nutrition education. (Purchase:$35.00.)

*FNIERC: Food and Nutrition Information and Education Resource Center, National Agricultural Library Bldg., Room 304, Beltsville, MD 20705. To order use Accession No., Title, and Format (motion picture, filmstrip, etc.). See further information on page 139.

D. Key words used in this lesson

1. CARBOHYDRATE: A group of nutrients that includes sugars, starches and cellulose; carbohydrates provide energy and fiber.
2. CELL: The basic structural unit of the body.
3. FATS: A Group of nutrients which providesa concentrated energy source and serve as carriers of certain vitamins. Body fat serves as a form of stored energy.
4. MINERALS: A group of nutrients that are used as body builders and regulators of body processes.
5. NUTRIENT: A substance obtained from food and used in the body to provide growth, maintenance, and repair.
6. PROTEINS: A group of nutrients needed for growth, maintenance, and repair of body tissues.
7. VITAMINS: A category of nutrients needed in very small amounts by the body but essential for normal body functions.

E. References for additional information

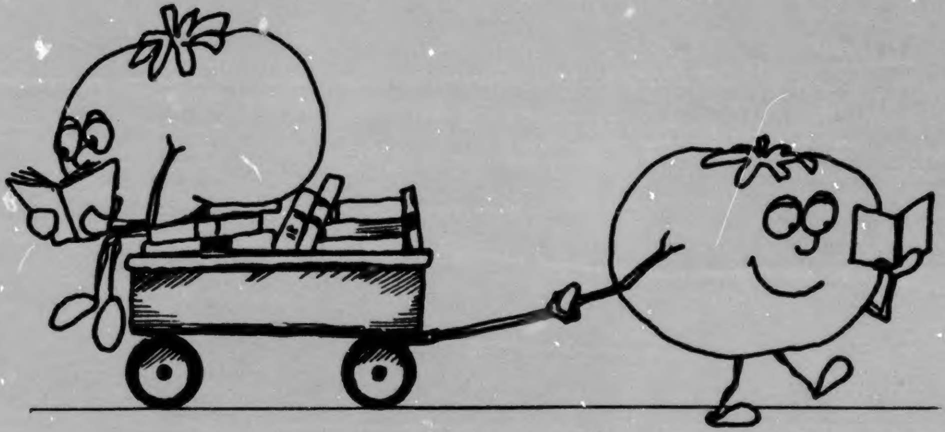
1. Labuza, T.P., and A.E. Sloan. Contemporary Nutrition Controversies. West Pub., Co., St. Paul, MN, 1979 (pp. 24-39). Current issues in nutrition discussed: vitamins, nutritional requirements, nutrition and the athlete, obesity and diet, heart disease and diet, cancer and diet, food safety, food processing. (pp. 24-39: report on American diet and health). 510 pp., $11.95.
2. Lowenberg, M.E., N.E. Todhunter, E.D. Wilson, J.R. Savage and J.L. Lubawski. Food and People, 3rd Edition. John Wiley and Sons, New York: 1979. Cultural aspects of food: food patterns, past and present; food and religion; food and business; malnutrition; programs to improve nutrition. 382 pp.
3. McWilliams, M. Nutrition for the Growing Years. Third Edition. New York: John Wiley and Sons, 1980. Text on child nutrition includes basic nutrition, physical and mental development related to nutrition, pregnancy and lactation, nutrition for infants through adolescence, weight control and special nutritional needs. 491 pp.
4. Pipes, P. Nutrition in Infancy and Childhood. Second Edition. St. Louis, MO: C. V. Mosby Company, 1981. Nutrition information for children between infancy and adolescence: nutrients necessary and their amounts, food patterns, special dietary intake concerns, feeding and related problems, and feeding and behavior management. $11.95 paperback.
5. Wason, B. Cooking to Please Finicky Kids. New York: Association Press, 1969. Out of print. Available in many libraries.
6. Whitney, E. and M. Hamilton. Understanding Nutrition. St. Paul, MN: West Publishing Co., 1981. 2nd Edition. General nutrition text including nutrients and their functions; digestion, absorption and metabolism of foods; weight control nutrition through the life cycle. Each chapter offers discussion on controversial nutrition issues such as sugar, cholesterol, world supply of protein, diet fallacies, vitamin C, and the common cold. 650 pp.
7. Food. U.S. Dept. of Agriculture, Home and Garden Bulletin No. 228, Science and Education Administration, Washington, D.C. Stock No. 001-000-03881-8. Feb. 1980. An attractive booklet about food groups, the daily guide, and creative recipes.

8. A poster series by David E. Newton: J. Weston Walch, publisher, Box 658, Portland, Maine 04104. Topics covered: Nutrition, Food Problems at Home and Abroad (18 posters, 11 x 14, $8.50) and Vitamins and Minerals, (18 posters, 11 x 14, $8.50). These two poster series contain attractive visuals to enhance the information given on the posters. Nutrition issues such as: world supply of protein, diet fallacies, vitamin C, and importance of vitamins.

9. National Academy of Sciences. Recommended Dietary Allowances. Ninth Edition (02941-1), 1980. Office of Publications, 2101 Constitution Ave., Washington, D.C. 20418 ($6.00).

10. Dean, A. 1975. Changing Food Habits. Michigan State University Cooperative Extension Bulletin No. E-613 (check with your local Cooperative Extension Service).

11. Bass, A., L. Wakefield, and K. Kolasa. Community Nutrition and Individual Food Behavior. Minneapolis: Burgess Publishing Co., 1979. Description of food behavior of different age groups and of community food and nutrition programs. ($13.95).



LESSON 1: BACKGROUND OF NUTRITION CONCEPTS

LESSON CONTENT	CLASS ACTIVITY
A. What is nutrition? 1. It is different things to different people; almost everyone knows that nutrition involves food, but most people are not sure exactly how. 2. Nutrition involves knowledge about what foods people eat, the nutrients contained in these foods, and the way nutrients are used by the body. 3. An adequate diet means eating foods which contain nutrients in the right amounts to maintain and promote health.	Show an introductory film (see suggested list of films: pages 1-2.
B. What are nutrients? 1. Nutrients are the chemical components which make up food. They are used by the body for energy, growth, maintenance and repair of the body tissues, and regulation of body processes. 2. Nutrient groups include proteins, carbohydrates (including fiber), fats, vitamins, minerals, and water. 3. All nutrients must work together to serve the body's needs. 4. All persons, throughout life, need the same nutrients; however, the amounts which are needed depend upon several factors, including:	

LESSON CONTENT	CLASS ACTIVITY
a. age b. sex c. activity level d. growth stage e. state of health f. body shape and size g. emotional and mental health h. racial and ethnic differences i. other individual differences	Use Nutrition Treasure Boxes as described on page 12. (Handout 1-1)
C. What are the functions of food in nutrition?	
1. The main function of food is to provide energy for body activities such as digestion, heart and lung action, muscular activity, brain and nerve functions, and to keep the body warm. The nutrients that provide energy are carbohydrates, fats, and proteins.	
2. Another function of food is for growth, maintenance, and repair of body parts. The nutrients primarily responsible for this function are protein, minerals, and water.	
3. A third function of food is to aid in the control and regulation of body functions. This is a major role of vitamins, although all nutrients are involved in these regulation activities.	

LESSON CONTENT

D. What are the advantages of good nutrition?

1. Adequate nutrition is one of the requirements for maintaining a healthy body. For example, if inadequate vitamin C is consumed, the body will bruise easily and the gums will bleed.
2. Good nutrition is important to all parts of the body. Every cell must be fed with the nutrients.
3. Nutrition can affect the overall picture of growth and development. It can determine how much of the individual's potential growth will be achieved.
4. Nutrition is one of the many factors which affect physical and mental ability.
5. Good nutrition can help the body resist infections and disease.
6. Getting enough of one nutrient does not guarantee adequate amounts of other nutrients. In the USA, for example, calorie consumption tends to be higher than the amount specified in the Recommended Dietary Allowances, while iron and calcium consumption are lower (see reference list, Labuza and Sloan).

   a. All nutrients must work together to keep the body running smoothly. If even one nutrient is deficient, the work of several can be impaired.

CLASS ACTIVITY

Show pictures of individuals in the USA with malnutrition, for example: obesity, dental disease, excess fluoride's effect upon teeth, visual defects in vitamin A deficiency (see reference list, poster series by David E. Newton - Nutrition; Food and Problems at Home and Abroad; and Vitamins and Minerals. Also look for pictures in magazines and nutrition books.

LESSON CONTENT	CLASS ACTIVITY
b. Even if adequate energy foods are eaten, the body cannot use the energy if the B-vitamins and iron are deficient. c. Even if calcium is consumed, it cannot be absorbed without vitamin D. E. What factors other than nutrition affect which foods we choose to eat? 1. Nutrition is only one of the reasons for choosing specific foods. Other reasons include:	TOMATO SOUP POWDERED EGGS
a. How the food tastes, feels, smells, and looks, attractive service of food. b. Availability. Availability includes: (1) if the food is grown where the person lives or is available in the area; (2) whether the family or other purchaser selects the food; (3) if the purchaser can afford the food: does it cost too much money? c. Manageability is an important factor for children. For example, large sandwiches should be cut into smaller pieces and finger foods are enjoyed.	Discuss the appearance of food and how to improve it. Show some samples of foods that have been modified and discuss acceptability (e.g., curdled macaroni and cheese, dry rolls, prepackaged foods, melted ice cream, cold coffee). Perhaps some foods that are acceptable to other cultures may not be in ours. As a group list some ethnic foods that would be acceptable in your school (i.e., Mexican, Chinese, African-American foods).

LESSON CONTENT

d. The particular social and cultural pattern of the group to which the individual belongs. The following are important factors:

- (1) religion;
- (2) meanings of food in the specific culture, such as being a symbol of hospitality, friendship, or social status;
- (3) other influences to which the individual is exposed, such as television, other people, or personal experiences;
- (4) national origin of the individual's group;

e. The particular emotional meaning that food has for the individual. For example:

- (1) food may be used to represent power;
- (2) certain foods may evoke feelings of security or safety;
- (3) foods may relieve tension, loneliness and boredom;
- (4) foods may be chosen to express creativity, or one's personality, revolt, or dissent;

f. Education about good health and nutrition helps people to understand what to eat for good health and why.

CLASS ACTIVITY

Discuss individual food preferences and habits to illustrate differences. What 5 foods do you dislike? Make a list and share with other class members. Discuss reasons for likes or dislikes.

LESSON CONTENT

2. There are also special concerns about the food practices children are developing.

   a. The family may no longer be the primary group influencing children's eating habits.
   b. Parents do not usually seek advice from professionals on how to feed school-age children, although they often seek advice on the feeding of infants.
   c. Children need to be exposed to many different kinds of food so they will choose a variety of foods when they make their own food selections.
   d. The school may be one of the prime determinants of food practices in young children today.
   e. If children form good eating habits when they are young, these habits are more likely to remain when other forces begin to influence them.
   f. Schools should not use meals in relation to disciplinary measures. Eating may become associated with rewards or punishments.
   g. Children need to learn how to make informed choices in the face of a continually changing food supply.

CLASS ACTIVITY

Where can children or adults get good, accurate nutrition information? Make a list of resources on the blackboard (use local resources where possible):

Cooperative Extension Service
Dairy Council
Home Economist at high school or college
Nutritionist/Dietitian at Health Department or hospital
Dial-a-Dietitian (where available)
County Health Department
State Department of Public Health
Food and Nutrition Program - State Department of Education
School Support Services
USDA (U.S. Department of Agriculture)
FDA (Food and Drug Administration)
Supermarket (check accuracy of materials)

Discuss the role of school food service in forming food practices of children. Use Changing Food Habits bulletin listed in reference list, p.4.

Show film, "Quality Food, Quality Choice and Nutrition Education by the Food Service Worker." See film list, pages 1 [illegible] 2.

LESSON CONTENT	CLASS ACTIVITY
	Use Handout 1-2 to show how one school introduced a family style lunch program to their students, p.14.

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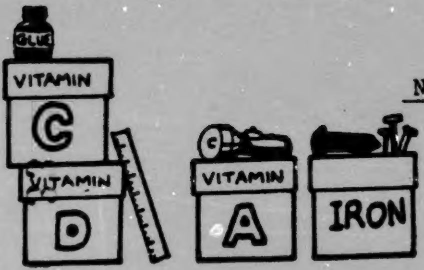


HANDOUT 1-1

NUTRITION TREASURE BOXES

Prepared by MARY KERR
Food and Nutrition Specialist
Michigan State University
Cooperative Extension Service

Teaching nutrition can be fun, and Mary Ostrowki, Supervisory Expanded Nutrition Aide from Kent County, has developed a winner.

Decorate five different boxes with covers to represent each of the five food groups. You might cut pictures from magazines and paste them on like a collage, then cover the whole thing with clear contact paper. When you discuss the five food groups, or when you cook food from a certain food group, use the boxes to teach about nutrition. Here is a list of things you could put into the boxes to illustrate various nutrients.

Nutrient	Object	Function
Protein	Brick	Bricks are for building and so is protein. In growing children, protein builds and repairs muscles, skin, hair, bones, blood, and nerves. In adults, protein helps repair them.
Carbohydrates and Fat	Gas can or piece of coal	Gas (coal) provides fuel for cars, homes and factorie Our bodies need energy, too, and carbohydrates and fats give us lots.
Iron	Railroad spike or large nail	This spike (nail) is made of iron. Iron is a very important part of our blood. It helps carry the oxygen we breathe to every part of our bodies.
Calcium	Sea Shells and bones (one bone soaked in vinegar for several days)	Calcium makes shells hard and it helps makes bones strong and firm. This bone (which was soaked in vinegar) doesn't have much calcium anymore, and you can see how rubbery it is. Calcium is also important for strong teeth. It helps muscles work, nerves carry messages, blood clot, and helps your heart beat
Vitamin D	Ruler	How do we use a ruler? For measuring things and for drawing straight lines. Vitamin D also helps make things straight--your bones. It helps your body use calcium so your legs and arms will grow straight and strong.
Vitamin A	Flashlight	If you're walking in the dark, a flashlight helps you to see. So does vitamin A. It helps your eyes adjus to the dark, and it helps you have healthy skin.
Vitamin C	Glue	Good old sticky glue, great for holding things together! Vitamin C helps your body cells stick together. It helps wounds to heal, too.
Thiamine	Telephone cord	Telephone wires send messages, and so do the nerves i our bodies. Thiamine helps nerves to stay healt[illegible] and helps our bodies use the carbohydrates we eat.

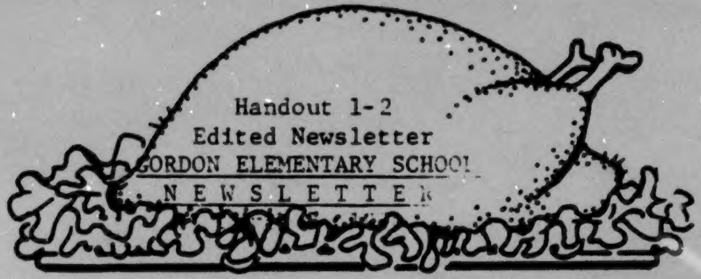
Nutrient	Object	Function
Riboflavin	Balloon	This balloon is full of carbon dioxide that I just blew into it. When I breathed in, my body kept most of the oxygen in the air and got rid of the carbon dioxide I didn't need. Riboflavin helps you use the oxygen you breathe, and it helps you have healthy eyes and mouth.
Niacin	Hammer and Saw	A carpenter uses a saw, hammer and other tools to take things apart and put them together in different ways. When food finally reaches your cells, niacin, as well as thiamine and riboflavin, help take it apart and put it together again in different forms. Niacin also helps you have healthy skin and nerves.

These items should be put into the food group boxes as follows:

Meat, Poultry, Fish and Bean group box	Brick, spike, telephone cord, hammer and saw, balloon, gas can (fat), flashlight
Milk & Cheese box	Balloon, brick, sea shells, ruler, flashlight, gas can (carbohydrate and fat)
Fruit & Vegetable box	Glue, spike, flashlight, hammer and saw, balloon, sea shells, gas can (carbohydrate)
Bread & Cereal box	Gas can (carbohydrate) spike, telephone cord, hammer an saw, brick (but emphasize incomplete protein), balloon
Fats, Sweets & Alcohol box	Gas can (fat and carbohydrate only - empty calories)

You could use these boxes at every food meeting, whether you're cooking jams and jellies, preserving pickles, making muffins, or whatever. Have the bread - cereal box handy when you're making yeast breads. Discuss what nutrients you'll get when you eat the bread and what they'll do for you. It should take only 10 minutes.

HAVE FUN!



Handout 1-2
Edited Newsletter

GORDON ELEMENTARY SCHOOL NEWSLETTER

Dear Parents:

We are pleased to announce that our new Family Style Lunch Program is well under way and is operating very successfully. In fact, we feel that the program is going so well that we would like to extend to you an invitation to come and have lunch with your child some day. We must limit our invitation to six adults per lunch period per day. Reservations will be taken on a first come first served basis. Each day you may make a reservation for lunch by calling the school secretary, Mrs. Vander Geest, before 9:00 a.m. of the day you wish to visit. Please indicate which lunch period you plan on visiting. The first and second grade period starts at 11:45 a.m., and the third and fourth grade period starts at 12:30 p.m. Lunches for adults cost $1.05, and you may purchase your tickets in the school office when you come to the school for lunch. We must ask that parents don't come and all sit at the same table. We need your help by spreading yourselves around the lunchroom and helping us with table manners, etc. Of course, if mom and dad come at the same time to have lunch with their son or daughter, we would like mom and dad to both sit with their own child. The best place to meet your child when you come to have lunch with him or her is in the back of the lunchroom. Please make every effort to come and visit us. I am sure it has been many years for most of you since you have eaten in a school cafeteria. Times have changed!!!

MENU FOR NEXT WEEK: MONDAY: HAMBURGER, FRENCH FRIES, ORANGE JUICE, MILK, DOUBLE PEANUT COOKIE; TUESDAY: SPAGHETTI, TOSSED SALAD, PEARS, WHOLE WHEAT BREAD; WEDNESDAY: HAM PATTIES, BUN, GREEN BEANS, BANANA, MILK; THURSDAY: PIZZA, CORN, TANGERINE GELATIN, PEACHES, MILK; FRIDAY: TURKEY SLICE ON BUN, TATER TOTS, FRUIT COCKTAIL, MILK, OATMEAL COOKIE.

THINK - MANNERS

TABLE MANNERS

Many, many years ago man ate only to fill his stomach. He ate with his fingers and on the floor of his cave. He didn't care how he looked when he ate. Neither did you when you were little. You grabbed and gobbled and threw your food. But now you are growing up and you do care how you look at mealtime. You also care about the kind of food you eat, the way the table looks, and the things you talk about. You want mealtimes to be pleasant times, and know that good table manners help.

Because Gordon School is a special place and students are growing up, we expect that they should be able to demonstrate good manners as they move through their daily routines at home and at school.

When people say that you have good manners, they generally mean that you always try and do things which show consideration for other people. It is important to know about good manners as you will need them every day of your life. You will feel good inside if you practice and learn the art of using good manners.

---

copies made by:
Jean McFadden, Cooperative Extension Service Specialist
Food Service Management, Department of Food Science and Human Nutrition
Michigan State University

Handout 1-2 (cont.)

By changing the Gordon lunchroom to Family Style dining, it helps all of us practice the use of good manners at the dinner table. Following are rules to use in the lunchroom:

1. Always walk in the lunchroom.
2. Find a seat quickly and sit down quietly.
3. Wait for directions from the waiter or waitress.
4. Sit up straight, elbows tucked in close.
5. Pass food around to the left - not across.
6. Pass or take the dish with both hands - lay your silverware in the proper place.
7. Conversation should not bother people at your table.
8. When you want more of something, wait for a pause in the talking. Then ask, "Please pass the __________."
9. Take at least a little of everything. Taste new foods.
10. Say, "No, thank you" if you don't want something.
11. Don't take a second helping unless you have finished the first; be sure everyone has had a first helping.
12. Don't take a second helping unless you plan to eat it.
13. Ask the waiter or waitress to please help you if you need help.
14. Eat food slowly; chew with your mouth shut.
15. Ask the waiter or waitress to excuse you when you are finished and your plate is all cleaned up by saying, "May I be excused, please?"
16. Upon being excused from the table, take your tray and silverware to the clean-up table.
17. Walk to the coat racks, put coat, hat, boots, mittens, etc., on, and go outside.
18. Cover your mouth when you cough or sneeze.

LESSON 2 PROTEIN: BODY BUILDER

A. Goal of this lesson

The goal of this lesson is to provide information about the nutrient group protein. Its functions in the body, and the foods that meet the customer's protein needs are studied.

B. Purpose of this lesson

After completing this lesson, the participants should be able to:

1. differentiate between the terms "essential amino acid" and "non-essential amino acid";
2. differentiate between the terms "complete" and "incomplete" protein, and match a group of protein foods to the correct type;
3. identify the function of protein in the body; and
4. identify sources of protein from a given list of foods.

C. Instructor preparation for class activities

1. Obtain Food Models from the National Dairy Council (see reference list for address) or foods (see list on p. 19-20.)
2. Use USDA Handbook #456, *Nutritive Value of American Foods in Common Units* or Home and Garden Bulletin #72. *Nutritive Value of Foods* for nutritive value of foods (see reference list).
3. Duplicate sufficient copies of handouts.

D. Key words used in this lesson

1. AMINO ACIDS: Small units that together make up proteins. They are often referred to as "protein building blocks".

2. ANTIBODIES: Proteins in the blood or other body fluid which aid in resisting or fighting infection and diseases.
3. COMPLETE PROTEIN: A protein food that contains all the essential amino acids in the correct amounts to sustain life and promote growth.
4. ESSENTIAL AMINO ACIDS: The amino acids which cannot be made by the body, but must be provided through the food eaten. Adults require eight essential amino acids; infants require those eight plus one additional.
5. HORMONES: Chemicals produced by a body gland,then carried by the blood to another place where they perform their functions.
6. INCOMPLETE PROTEIN: A protein that does not contain all the essential amino acids in correct amounts to promote growth.
7. LEGUMES: Plants such as peas and all kinds of beans, a source of protein from plants.
8. NONESSENTIAL AMINO ACIDS: Amino acids that can be made by the body from essential amino acids. Even though termed "nonessential" they are required by the body to make new protein.

E. References for additional information

1. Adam, C. Nutritive Value of American Foods in Common Units. Handbook 456, Agricultural Research Service, USDA, U.S. Government Printing Office, Washington, DC 20402, 1975 ($7.50).Stock No. 001-000-03184-8.
2. Adams, D.F. Nutritive Value of Foods. Home and Garden bulletin No. 72, United States Department of Agriculture. U.S. Government Printing Office, Washington, DC 20402 ($1.80), (Stock No. 001-000-03841-9).
3. Educational Filmstrip Catalog, Tupperware Educational Services, Dept. EFC80/P.O. Box 2353 Orlando,FL 32802
4. National Dairy Council, 6300 N. River Rd., Rosemont, IL 60018. Food Comparison Cards, Cost: $6.00. Food Models, Cost $4.00 - $5.50.
5. Whitney, E. and M. Hamilton. Understanding Nutrition. (See reference list, lesson 1)

LESSON 2: PROTEIN: BODY BUILDER

LESSON CONTENT	CLASS ACTIVITY
A. What is protein?	
1. Proteins are essential parts of all living cells and next to water are the most plentiful substance in the body. Proteins are necessary to maintain life and to promote growth.	
2. Proteins are composed of building blocks called amino acids.	Illustrate amino acids with pieces of a puzzle. Show how each is important, but they all must be present to make a picture complete (Handout #2-1, p.21).
a. Different proteins contain different combinations and amounts of these amino acids.	
b. In the adult, there are eight amino acids which cannot be made by the body. These are called "essential" amino acids and they must be supplied by the diet. Other amino acids which the body can make are called "non-essential" amino acids.	
c. Foods containing all of the essential amino acids in the proper amounts are called "complete" proteins. Complete proteins can maintain life and promote growth.	
d. Those foods lacking any of the essential amino acids in correct amounts are called "incomplete" proteins. Incomplete proteins may maintain life but will not allow normal growth.	
e. Foods which contain all the essential amino acids in proper amounts come from animal sources. Foods such as meats, fish, poultry, milk, and eggs have complete proteins.	Using Handout#2-2, p.22 underline the foods on the list that are good sources of protein.

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LESSON CONTENT

f. Foods which do not contain all the essential amino acids in proper amounts come from vegetable sources; such foods as dry beans, peas, nuts, bread, and cereals contain incomplete proteins. Whenever these protein sources are served, they must be used with a complete protein, or they may be combined with a complementary incomplete protein (such as legumes with grains) to provide the correct amino acid balance. For example, chili usually contains hamburger as well as beans, and cereal with milk or macaroni and cheese provide an adequate balance. Beans and rice are a popular Mexican-American combination; or from the South, blackeyed peas and cornbread. Even peanut butter on whole wheat bread supplies complete protein.

B. What does protein do in the body?

1. Protein is necessary for body growth; the protein requirement increases as the body gets larger.
2. All the body parts need a continuous supply of proteins for repair and replacement. For example, the lining of the stomach is replaced every 24 hours and red blood cells are replaced every four months.
3. Protein may be used for energy if the diet does not provide enough energy from carbohydrates and fats, or if more protein

CLASS ACTIVITY

Illustrate proper portion sizes providing appropriate amounts of protein for a particular age group of children. You may use actual foods or food models. Suggested foods to use are:

(a) 2 oz. cooked hamburger patty
(b) 3 oz. cooked hamburger patty
(c) 2 oz. tuna fish in salad sandwich
(d) 4 Tbsp. peanut butter in sandwich

LESSON CONTENT

is eaten than is needed for other functions. Protein provides four calories per gram.

4. Protein is needed to help form certain substances needed to build resistance to disease, or to regulate various body processes.
5. Protein has other functions such as helping to keep the correct amount of water inside and outside each cell, and keeping the blood from becoming too acid or alkaline.

C. Which foods contain protein?

1. Complete protein foods come from animal sources and include lean meats, poultry, fish, eggs, milk, and cheeses.
2. Incomplete protein foods come from vegetables and other plant sources which include nuts, breads, and cereals. Fruits and vegetables have very little protein. The legumes (dried beans and peas, soybeans, and peanuts) have the best protein of any plant foods commonly eaten.

CLASS ACTIVITY

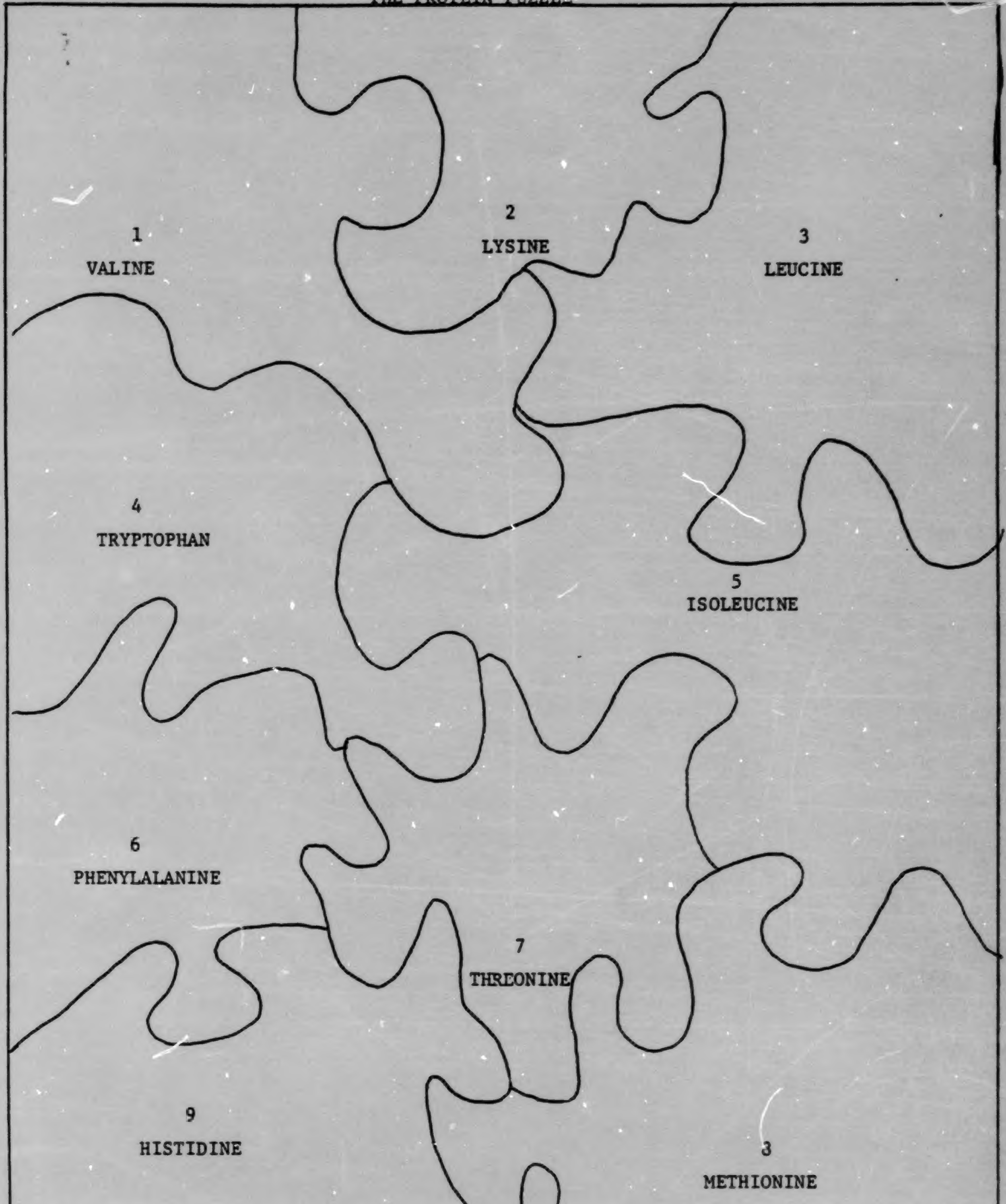
(e) ham (1 oz.) and cheese (1 oz.) sandwich
(f) 2 oz. cooked chicken on the bone
(g) 2 oz. cooked chicken off the bone
(h) open-faced sandwich with 1 slice hard cooked egg topped with 1 oz. cheese, broiled
(i) compare weight of breaded fish sticks with and without the breading

Individually or in pairs, have participants begin to fill in the Nutrition Chart (Handout #2-3). Begin by filling in the section on protein. This chart will be used again in each of the following lessons as other nutrients are described. For each nutrient on the chart, the major function(s) and primary food sources should be indicated.

Complete questions on Handout #2-4 on protein sources, using Handout #2-5.

HANDOUT #2-1

THE PROTEIN PUZZLE


1
VALINE
2
LYSINE
3
LEUCINE
4
TRYPTOPHAN
5
ISOLEUCINE
6
PHENYLALANINE
7
THREONINE
9
HISTIDINE
3
METHIONINE

Remember: infants require nine amino acids; adults only eight.

HANDOUT #2-2

FOODS TO GROW ON

Underline the foods in the list that are good sources of protein:

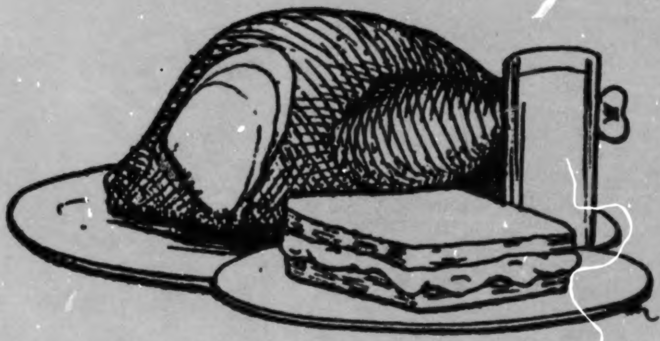
½ c APPLE CRISP
2 BISCUITS AND HONEY
½ c BROCCOLI
2" x 2" CARROT CAKE SQUARE
½ pt. CHOCOLATE MILK
1/8 section CHOCOLATE PIE
EGG SALAD SANDWICH (made with 1 egg)
½ c GELATIN SALAD
4 oz. LASAGNE MADE WITH HAMBURGER
3 SNICKERDOODLES
1 c SPANISH RICE (NO MEAT)
3 SWEDISH MEAT BALLS (2 oz. each)
3 oz. SCALLOPED POTATOES WITH BUTTER
3 oz. TURKEY PLUS DRESSING
4½ c TUNA CASSEROLE

ANSWER KEY FOR HANDOUT #2-2

Foods to Grow On

The following words should be underlined:

LASAGNE
TUNA CASSEROLE
TURKEY
MILK
EGG SALAD SANDWICH
MEAT BALLS



NUTRITION CHART

HANDOUT # 2-3

Nutrient	Function	Food Sourc
1. Protein		
2. Carbohydrate		
3. Fat		
4. Vitamin A		
5. Vitamin D		
6. Vitamins E and K		
7. Vitamin C		
8. B-vitamins		
9. Vitamin B_{12}		
10. Calcium and Phosphorus		
11. Iron		
12. Trace Minerals		
13. Water		

MSU-NET
FSHN/80

HANDOUT #2-4

USING THE 1980 RECOMMENDED DIETARY ALLOWANCE (RDA) CHART
(PROTEIN FOODS)

Directions: Use the amounts of foods listed on Handout #2-5 to fill in the amounts of foods needed by different age/sex individuals as described below. For example, a 5-year old child requires 1 oz. of chicken (boneless) for one-third their daily protein requirement.

1. A six-year old requires _____ oz. of cooked ground beef.
2. A seven-year old requires _____ cup(s) of cottage cheese.
3. A 15-year old boy requires _____cup(s) of spaghetti and meat balls.
4. A ten-year old girl require _____Tbsp. of peanut butter in her sandwich.
5. A 12-year old boy or girl requires _____cup(s) of scrambled eggs with milk.
6. A 18-year old girl requires _____ cup(s) of tuna salad.

ANSWER KEY

1. 1.5 oz.
2. ½ cup
3. 1½ cups
4. 3 Tablespoons
5. 2/3 cup
6. ½ cup

MSU-NET
FSHN/80

HANDOUT #2 - 5 - PROTEIN FOODS

Serving sizes of foods which will provide at least one-third of the Recommended Dietary Allowance for protein for children:

Foods for Protein (protein content)	Units	4-6 yrs.	7-10 yrs.	11 - 14 yrs.		15 - 18 yrs.	
		Male & Female **30g	Male & Female **34g	Male **45g	Female **45g	Male **56g	Female **46g
Ground Beef - broiled (7gm)	oz	1.5	2	2	2	2.5	2
*Milk - lowfat (10.3gm)	cup	1	1¼	1 3/4	1 3/4	2	1 3
*Milk -skim (8.8gm)	cup	1	1¼	1½	1½	1 3/4	1½
Cottage cheese (4% fat)(28.6gm)	cup	1/3	½	2/3	2/3	2/3	2/3
Cheese, cheddar (7.1gm)	oz	1½	1 3/4	2	2	2½	2
*Ice Cream (6.0gm)	cup	1½	2	2½	2½	3	2½
Chicken, breast, baked, no bones (7.7gm)	oz	1	1½	1 3/4	1 3/4	2	1 3
Tuna Salad (30mg)	cup	1/3	½	½	½	3/4	½
Eggs - scrambled, large (7.2gm)	count	1¼	1¼	1 1/3	1 1/3	1½	1 1
Beans, cooked, navy (14.8gm)	cup	2/3	3/4	1	1	1¼	1
***Bread, whole wheat (2.4gm)	slice	3	4	5	5	6	5
***Bread, white, enriched (2.4gm)	slice	5	6	8	8	9	8
Macaroni & cheese, canned (9.4gm)	cup	1	1¼	1½	1½	1 3/4	1½
Peanut Butter (4.0gm)	Tbsp	2½	3	4	4	4½	4
*Yogurt, skim milk (8,3gm)	cup	1¼	1½	1 3/4	1 3/4	2¼	1 3
Pizza, cheese (10" pie with 7 pieces 5.4gm)	piece	1 3/4	2	2 3/4	2 3/4	3¼	2 3
Spaghetti with meat balls, canned (12.3gm)	cup	1	1	1¼	1¼	1½	1¼

*Not acceptable for meat or meat alternate in the school lunch pattern.

**This amount will provide 100% of the 1980 RDA for that group.

***Bread should not be used as the primary protein source. However, it does contribute some protein.

Data from: 1980 Recommended Dietary Allowances and Nutritive Value of American Foods in Common Units, 1975.

Lesson 3

CARBOHYDRATES AND FAT

A. Goal of this lesson

The goal of this lesson is to provide information about two nutrient groups, carbohydrates and fat, and their role within the body.

B. Purpose of this lesson

After completing this lesson, the participants should be able to:

1. list three groups of carbohydrates and tell the prime function of each within the body;
2. name the two types of work the body performs as described in this lesson and give two examples of each type of work,
3. identify the functions of carbohydrates and four functions of fat;
4. differentiate between the terms "visible" and "invisible" fat and list three examples of both types,
5. name an essential fatty acid and define the term, "essential fatty acid"; and
6. discuss the relationship between dietary fat and heart disease.

C. Instructor preparation for class activities

1. Obtain National Dairy Council Comparison Cards; Handbook #456, Nutritive Values of American Foods in Common Units; and Bowes and Church's Food Values of Portions Commonly Used (see reference list for a[illegible]ses). Or collect food samples for activities on pages 29, 31, 32.
2. Use absorbent toweling and a fatty food to show invisible fat (see page 31 for details).
3. Duplicate sufficient copies of Handout #3-1, Using Handbook #456.
4. Collect food labels for class activities (p. 31).

D. Key words used in this lesson

1. BASAL METABOLISM: Energy used to carry on essential body processes such as lung and heart action.
2. CALORIE: A unit of energy released as heat. A calorie is NOT a substance. Calorie is abbreviation for kilocalorie.
3. CHOLESTEROL: A fatty substance manufactured in the body and found in animal foods. In small amounts it is essential for the body, but in excessive amounts it has been implicated in heart disease.
4. FIBER: Undigestible carbohydrates including cellulose; also called bulk.
5. GRAM: A metric unit of weight. There are 454 grams in a pound.
6. METABOLISM: All chemical changes which occur in the body cells and other living matter.
7. POLYUNSATURATED FATTY ACID: Fatty acids that chemically can take up more hydrogen atoms. Vegetable oils (excluding coconut oil) are more unsaturated than animal fats. Polyunsaturated fats are generally liquid at room temperature.
8. SATURATED FATTY ACID: Fatty acids that chemically have as many hydrogen atoms as they can hold. Animal fats and coconut oil are highly saturated. Most saturated fats are solid and opaque at room temperature.

E. References for additional information

1. Adams,D.F. Nutritive Value of American Foods in Common Units. (See reference list, lesson 2).
2. Pennington, J.A.T. and H.N. Church. Food Values of Portions Commonly Used. Thirteenth Edition, Philadelphia: J. B. Lippincott Co., 1980. ($11.50)
3. Briggs, G.M. and D. Calloway. Bogert's Nutrition and Physical Fitness. Tenth Edition. Philadelphia: W. B. Saunders Co., 1979. General nutrition text: nutrients, their functions and sources; diet and health during pregnancy, lactation, infancy, childhood, athletic training; diet and dental health; diet and overweight; diet and underweight; malnutrition in a global perspective.
4. Guthrie, H. Introductory Nutrition. Fourth Edition. St. Louis: C. V. Mosby Co., 1979. General nutrition text including basic principles of nutrition, selection of an adequate diet, nutritional status evaluation, nutrition through the life cycle, alternative food patterns, and weight control. 624 pp., ($19.95).

5. Robinson C. Normal and Therapeutic Nutrition. Fifteenth Edition. New York: The Macmillan Co., 1977. Normal nutrition section includes information on nutrients, their functions and sources; meal planning; food habits; cultural food patterns; safety of food supply; nutrition throughout the life cycle; nutrition education. Therapeutic nutrition section includes factors in patient care, diet changes for disease states, food exchange list, weight control, and diet related to many disease states. ($17.95)

6. Food Technology, December 1979, pp. 39-64. This issue contains a series of articles dealing with the relationship of diet to disease. Published by the Institute of Food Technology.

Articles: Nutrition and Heart Disease, by D. Kritchevsky
Obesity, The American Disease, by T. B. VanItallie, M.D.
Food as a Factor in the Etiology of Certain Human Cancers, by G. B. Gori
Sodium and Potassium in High Blood Pressure, by J. D. Abernathy, M.D.
Diabetes and Diet, by H. P. Chase, M.D.

7. National Dairy Council. (See reference list, lesson 2).

LESSON CONTENT

A. What is a carbohydrate (CHO)?

1. Carbohydrates are one class of energy-producing nutrients.
2. Carbohydrates include starches, sugars and cellulose (fiber).
   a. Starches (also called carbohydrates) are found primarily in breads and cereals, potatoes and other vegetables.
   b. Sugars (also called simple carbohydrates) include table sugars (sucrose), syrup, and sugars in honey, molasses, and in fruits. Milk also contains the sugar lactose.
   c. Very little carbohydrate is found in animal products other than milk.
   d. Some children cannot digest the milk sugar lactose. These children should be provided with alternatives to milk. Some of these children can tolerate yogurt or buttermilk as the fermentation breaks down the lactose into simple sugars so that it can be digested.
3. Carbohydrates are the least expensive source of energy-producing foods. They are the second most abundant class of nutrients in American diets; only water is consumed in larger amounts than carbohydrates. Currently, Americans are encouraged to eat more carbohydrates and less fat and protein.

B. What do carbohydrates do in the body?

CLASS ACTIVITY

Show actual foods, food models, or pictures to illustrate which foods contain high levels of carbohydrate. From the following samples, ask participants to list which foods are highest in carbohydrates.

(a) canned fruit
(b) hamburger
(c) hamburger bun
(d) rice cereal
(e) raw apple
(f) peas
(g) milk
(h) ham sandwich
(i) corn
(j) egg (hard cooked)
(k) potato chips
(l) orange juice

Using the Agriculture Handbook #456, Nutritive Values of American Foods, Bowes and Church's Food Values of Portions Commonly Used, or the National Dairy Council Comparison Cards, compare carbohydrate and calorie content of pairs of food such as:

(1) whole wheat bread vs. cake
(2) apple vs. apple pie
(3) broiled fish vs. fish sticks
(4) potatoes vs. french fries vs. potato chips
(5) whole milk vs. 2% milk, vs. skim milk vs. milkshake vs. ice cream
(6) canned peaches in heavy syrup vs. raw apple

LESSON CONTENT | CLASS ACTIVIT

1. Sugar and starches provide energy to the body. They provide four calories per gram.
2. This energy is needed for the body to perform two types of work:
   a. Internal work such as the beating of the heart, and producing body heat. This work is called the basal metabolism.
   b. Voluntary work such as action, movement, and play.
3. The body prefers carbohydrate over protein as an energy source. By using carbohydrate for energy, protein may be used for its other functions. This is sometimes called the "protein-sparing action" of carbohydrate.
4. Cellulose (fiber), a carbohydrate that humans cannot digest, provides bulk in the diet, helps to prevent constipation, and aids in keeping the digestive organs healthy.
   a. Cellulose and other undigested carbohydrates are called dietary fiber. Some recent research seems to link a lack of fiber with various diseases; it must be remembered, however, that these relationships have not been proven.
   b. Fibers absorb water which helps to keep the stools soft and moving easily through the intestine.
   c. Since fibers are not digested, they do not contribute calories to the diet.

LESSON CONTENT

C. What are fats?

1. Fats are another class of nutrients which provide energy to the body. Both solid fats and oils are included in the group.

    a. Visible fats are butter, margarine, oils, and the layer of fat around meats.

    b. Invisible fats are the fats within meats, whole milk products, ice creams, cheese, egg yolk, nuts, whole grains, baked products, and fried foods.

2. There are several kinds of fats.

    a. Fatty acids are the most common type of fat. There are two major classes of fatty acids: saturated and unsaturated. This classification depends on the amount of hydrogen present.

        (1) Saturated fats are solid at room temperature. They are found primarily in meats, whole milk, butter, egg yolks, lard, and solid vegetable fats. Coconut and palm oil also contain significant amounts of saturated fats, although they are from vegetable sources.

        (2) Unsaturated fats are liquid at room temperature. They are found primarily in vegetable oils and soft margarines (especially from corn, soy, and safflower), grains and seeds, and fish.

CLASS ACTIVITY

Show "invisible" fat in meat by soaking a piece of meat in water for 24-hours and then observe the fat floating on top of the water. Or crush potato chips or cracke on a piece of absorbent paper to show the that is absorbed in the paper.

Make peanut butter from fresh roasted peanu or purchase fresh or unhydrogenated peanut butter. Demonstrate the separation of the oil from the solids; compare with commercia hydrogenated peanut butter that does not separate. (Hydrogenation makes the fat "saturated").

Discuss polyunsaturated margarines. Use Handout #3-1. Have participant bring margarine labels.

LESSON CONTENT

(3) Fats in foods are usually a combination of saturated and unsaturated fatty acids.

b. Sterols are another type of fat. Cholesterol is the best known sterol in foods. Only foods of animal origin contain cholesterol but it is also made by the body. The amount of cholesterol is especially high in egg yolks and organ meats.

c. Most fats can be made by the body from other substances such as carbohydrate or protein. One fatty acid cannot be made, but is necessary to the body and thus is called the "essential fatty acid". This fat must be present in the diet. A balanced diet will easily provide this nutrient.

d. Excessive use of fat may increase the risk of heart disease. Some scientists recommend decreasing the use of saturated fats and substituting unsaturated fats. The frequent use of foods containing cholesterol in large amounts has also been discouraged.

e. Nutritionists recommend that the total amount of fat in the diet should be lowered. The meals served as part of the Child Nutrition Program are important in the development of food practices; lowering fat in these meals may encourage children and their parents to use less fat at home as well.

(1) The amount of fat in American diets has been steadily increasing. Almost one-half of our calories come from fat.

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CLASS ACTIVITY

Bring food samples to class and read food labels to find sugar, fats, and cholesterol. For example:

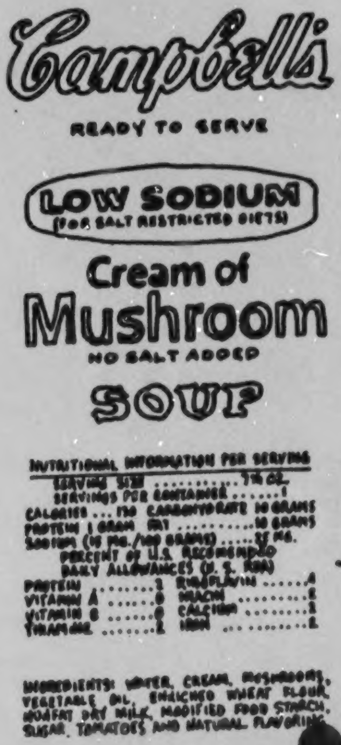
ketchup

3 kinds of dry cereal

granola-type cereal

mayonnaise

canned fruits and vegetables


Campbell's
READY TO SERVE
LOW SODIUM
(FOR SALT RESTRICTED DIETS)
Cream of
Mushroom
NO SALT ADDED
SOUP
NUTRITIONAL INFORMATION PER SERVING
INGREDIENTS: WATER, CREAM, MUSHROOMS, VEGETABLE OIL, ENRICHED WHEAT FLOUR, NONFAT DRY MILK, MODIFIED FOOD STARCH, SUGAR, TOMATOES AND NATURAL FLAVORING

LESSON CONTENT	CLASS ACTIVITY
(2) Some professionals suggest that energy from fats should not make up more than 35% (about one-third) of our total calories,	
D. What do fats do in the body?	
1. Body fat stores provide energy for use in other body parts. They supply nine calories per gram, twice as much as carbohydrate or protein. This stored energy may be used for body functions, physical activity, and in producing heat.	Using Handout #3-2, Using Handbook #456, and Agricultural Handbook #456, complete the required information on fat and calorie contents of listed foods.
2. Fat surrounds the organs to hold them in place and to protect them from injury. It also acts as insulation to maintain body temperatures.	
3. Fats carry various substances in the blood. Some examples are vitamins A, D, E, and K, and other fats such as cholesterol.	Using Handout #3-3, continue Nutrition Chart from lesson 2, (Handout #2-3) by completing the functions and sources of carbohydrates and fats.
4. Fats in foods provide the feeling of fullness, and delay the development of hunger by slowing digestion.	
5. Cholesterol is essential in building brain and nerve tissues, and is also used in digestive juice (bile).	

HANDOUT #3-1

WHAT IS A POLYUNSATURATED MARGARINE?

First, read the label.

SAMPLE LABEL

NRG BRAND POLYUNSATURATED MARGARINE
Nutrition Information per Serving

Serving Size	14 grams (about 1 Tbsp.)
Servings per container	32 (per pound container)
Calories	100
Protein	0
Carbohydrate	0
Fat	11 grams
Percent of calories from fat	over 99%
Polyunsaturated	4 grams
Saturated	2 grams
Cholesterol	0 (0 per 100 grams)

Here is how to use this information. Look at the amount of polyunsaturated and saturated fats:

If the margarine contains:

At least twice as much polyunsaturated as saturated fat	Then it is considered as a polyunsaturated margarine from a health view
Less than twice as much polyunsaturated as saturated fat	NOT considered as a polyunsaturated margarine from a health view

To determine if the margarine is considered or not considered a polyunsaturated margarine from a health view, divide the number of grams of polyunsaturated fat by the number of grams of saturated fat. If the answer is 2 or higher, the margarine is considered polyunsaturated.

Also check the list of ingredients on the label. The first ingredient should be liquid oil, not hydrogenated or partly hydrogenated oil.

If a margarine does not contain a nutrition label, or has one that is incomplete, look for one that has the key information, described above, listed.

Read labels each time - manufacturers occasionally change product ingredients.

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HANDOUT #3-2

USING HANDBOOK #456

Using Handbook #456, Nutritive Value of American Foods in Common Units, compare the fat and calorie contents of foods on the following list:

	Fat Content	Calorie Content
1. 1 medium boiled potato		
2. ½ cup french fries (10 strips)		
3. 10 potato chips		
4. 1 whole raw apple (2-3/4" diam.)		
5. 1/8 apple pie		
6. ½ c fruit cocktail, heavy syrup		
7. ½ c green salad, chopped shredded lettuce		
8. ½ c kernel corn, wet pack, canned		

ANSWERS:

1.	0.1 gm	104 with skins
2.	6.6 gm	73 pared
3.	8.0 gm	137
4.	0.8 gm	80
5.	13.1 gm	173
6.	0.15 gm	97
7.	0.15 gm	4
8.	0.75 gm	85

Handout 3-3

TYPES OF FATTY ACIDS IN SELECTED PRODUCTS

per 100 gram portions

Products	Saturated		Monounsaturated		Polyunsaturated	
Animal Fats	gms	%	gms	%	gms	%
Butter	46	61	27	36	2	3
Lard	38	40	46	49	10	11
Margarines, first item on label						
Hydrogenated fat	18	23	47	59	14	18
Liquid oil	19	24	31	39	29	37
Oils						
Peanut	18	19	47	50	29	31
Corn	10	11	28	31	53	58
Safflower	8	8	15	16	72	76

(These figures are shown in bar graphs on the other side of the page.)

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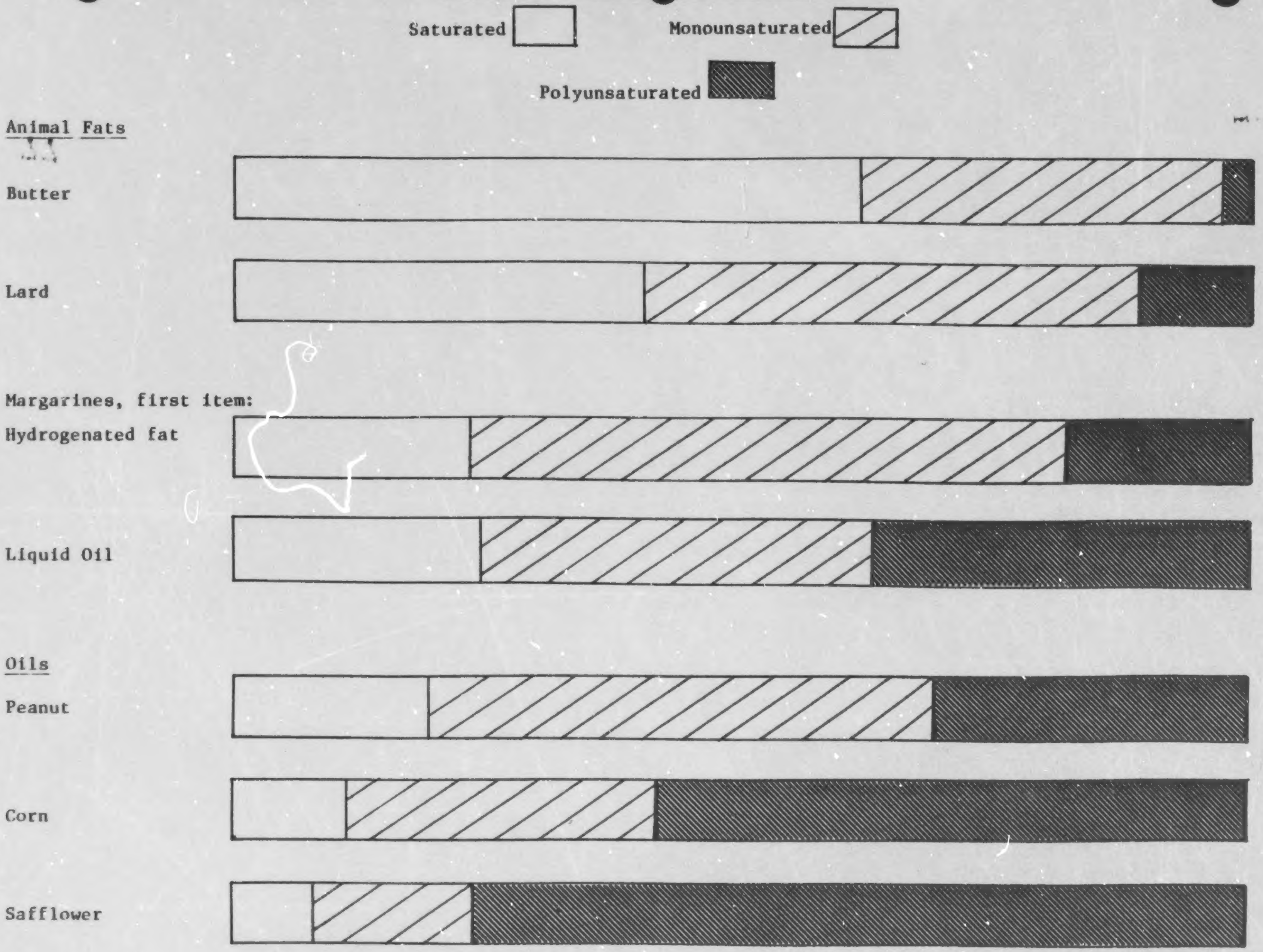
Source: USDA. Handbook of the Nutritional Content of Foods. 1975.



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ENERGY FOODS FOR CHILD NUTRITION PROGRAMS

LESSON 4

A. Goal of this lesson

The goal of this lesson is to provide information about the foods which provide energy, and to identify the foods containing each of the three energy nutrients, carbohydrate, fat, and protein.

B. Purpose of this lesson

After completing this lesson, participants should be able to:

1. Identify foods containing primarily carbohydrate, fat or protein.
2. Give examples of foods providing energy from carbohydrate or fat, but few other nutrients.
3. Give examples of foods which provide vitamins and minerals as well as energy nutrients.
4. State at least two problems resulting from excessive energy intake, and suggest ways to prevent these problems.

C. Instructor preparation for class activities

1. Duplicate sufficient copies of handouts. Review the handouts to be sure that you are familiar with their contents.
2. Collect samples of dry or cooked legumes (see page 40).
3. Locate National Dairy Council Comparison Cards (see reference list lesson 2 for address) for activity (p. 41).
4. Prepare visual for Calorie Circle activity (page 40).
5. Obtain nutrient density poster (p. 41).
6. Select films from suggested list (optional):

   Fuel for Life (No. 2 of Food for Youth Series). New England State Educational Council, Inc. U.S. Food and Nutrition Service. Descriptors: Nutrition Education; cells, growth and development; energy; digestion and absorption; mental and physical development. Available from FNIERC. Acc. No. 745-74 (30 min., color: 16mm.)

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Food, Energy and You. Perennial Education, Inc., 477 Roger Williams, P.O. Box 855, Ravinia, Highland Park, IL 60055. (312) 433-1610. Descriptors: Nutrition education; energy; food habits; weight control; elementary education. (20 min., color; video cassette, rental $38.00, purchase: $326.00). Available from FNIERC, Acc. No. 210-73.

Nutrition: Fueling the Human Machine. BFA Educational Media, 2211 Michigan Ave., P.O. Box 1795, Santa Monica, CA 90406. (phone: (213) 829-2901) (Order No. 11803, 17-3/4 min., color; 16mm., purchase $355.00, 3-day rental $50.00).

D. Key Words used in this lesson

1. MINIMAL NUTRIENT FOODS: Foods which provide energy from carbohydrate or fat but contain few other nutrients.
2. ENRICHED PRODUCTS: Foods to which specified nutrients have been added to replace those lost in processing (niacin, riboflavin, thiamin, iron).
3. NUTRIENT DENSITY: A method of assessing the nutritional quality of foods; the ratio of nutrients to calories. High nutrient density means an ample supply of nutrients to the number of calories. Low nutrient density means many calories with few nutrients.

E. References for additional information

1. Adams, D.F. Nutritive Value of American Foods in Common Units. (See reference list, lesson 2)
2. Dean, Anita. Choosing Food for Health: A Guide to Nutrition. Extension Bulletin #E-855. Cooperative Extension Service, Michigan State University. 1977 (40¢).
3. Poster: Nutrient Density Scores. ($1.00); Aim High for Health booklet (nutrition scores for 450 foods) and Nutrition Score poster (18 x 24 color shows nutrient density scores for 175 foods). ($2.95). Basic and Traditional Food Association, 1707 N. Street, N.W., Washington, D.C. 20036. 1979. (202)872-1506.
4. Brown, G., B. Wyse, and R.G. Hanson. 1979. A nutrient density - nutrition education program for elementary schools. Journal of Nutrition Education, 11(1):31-36.

LESSON 4: ENERGY FOODS FOR CHILD NUTRITION PROGRAMS

LESSON CONTENT

A. Carbohydrate, fat, and protein can all be used by the body for energy.

1. The body prefers to use carbohydrates or fat for energy, and saves the protein for body building and repair.
2. Energy is used by the body for its normal functions (described in lesson 1), heat production, and in physical activity.

B. Fruits and vegetables are composed of water, fiber, vitamins, minerals, and some starches and sugar.

1. Fiber helps to keep the intestines regulated.
2. Dark green, leafy and deep yellow vegetables are good sources of vitamin A and minerals.
3. Citrus fruits, tomatoes, strawberries, and many other fruits and vegetables provide vitamin C.

C. Whole grain breads and cereals provide fiber, B-vitamins, and minerals in addition to carbohydrate. Enriched breads and cereals also provide these nutrients.

D. Generally, animal products provide more fat and protein than plant products, while the plant foods provide carbohydrate.

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CLASS ACTIVITY

Show one of the three films listed under references at the beginning of this lesson. Discuss what new things participants learn from the film.

Show examples of dry or cooked legumes such as lima, navy, soy and pinto beans, split peas and lentils.

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LESSON CONTENT

E. Some foods contain all three energy-producing nutrient groups.
   1. Legumes and whole grains provide protein, fat, carbohydrate, fiber, minerals, and B-vitamins.
   2. Milk contains protein, fat, and the sugar lactose, in addition to valuable minerals and vitamins.

F. Some foods provide very few nutrients other than fat or carbohydrate. There foods are sometimes called "minimal nutrient foods"; they should not be used frequently. Another term sometimes used is "nutrient density" this refers to the ratio of calories to nutrients. Spinach, for example, has high nutrient density, while candy would have low nutrient density.

G. It is important to eat a diet which provides the correct balance of calories and other nutrients.
   1. Consuming more energy than is used leads to obesity. In order to use up extra energy to prevent its storage as fat, one must increase activity. An exercise program helps to use up this excess.
   2. By avoiding the use of the "minimal nutrient" foods, it is possible to prevent an excess of calories.

CLASS ACTIVITY

Use National Diary Council Comparison Cards to illustrate "minimal nutrient foods" such as soda pop, cake, salad dressing vs. foods with high nutrient levels such as fruits, vegetables, meats or grain.

Compare pairs such as apple with apple pie; potato chips, french fries, and baked potato; tossed salad with and without dressing; bread and cake for nutrient density.

Use Nutrient Density Poster (see reference list for lesson 4) to illustrate "minimal nutrient" foods.

Using Handout #4-1, discuss how calories increase when adding refined carbohydrate or fat to foods. Discuss appropriate substitutions of low- for high-calorie foods.

Complete and discuss the "Calories Circles Activity" Handouts #4-2, 4-3, and 4-4.

Review Handout #4-5, "Energy Use in Exercise".

Divide group into pairs and ask each participant to complete the puzzle on Handout #4-6, 4-7 (and 4-8 answers later).

LESSON CONTENT	CLASS ACTIVITY
3. Many vitamins and minerals are needed to process the energy from foods into a form usable by the body. By getting too many calories, these nutrients tend to be used up faster, and thus may not be available for their other functions. 4. It is best to choose a diet that consists of foods which are high in vitamins and minerals as well as the energy nutrients. Fresh fruits and vegatables, whole grain products, meats and milk are good examples.	

ALTERED CALORIE VALUES

HANDOUT #4-1

	Calories		Calories
Fried Chicken (3 oz.)	171	Broiled Chicken, 3 oz.	116
Baked Potato, 1 med.	145	Baked Potato, 1 med.	145
Sour Cream, 1T	25		
Butter, 2 pats	70	Butter, 1 pat	35
Broccoli (1/2 c)	20	Broccoli (1/2 c)	20
Cheese Sauce, 2T	65		
Green Salad, 1 c	10	Green Salad, 1 c	10
Italian Dressing, 1T	85	Lemon juice with herbs 1T	4
Apple Pie	345	Fresh Apple	80
A la mode (1/2 c)	135		
Coffee with	5	Coffee with	5
Cream 1T	30	Skim milk, 1T	5
Sugar, 1tsp.	15		
Whole milk, 1 c	150	Skim milk, 1 c	85
TOTAL	1271		510

It's your choice to make!

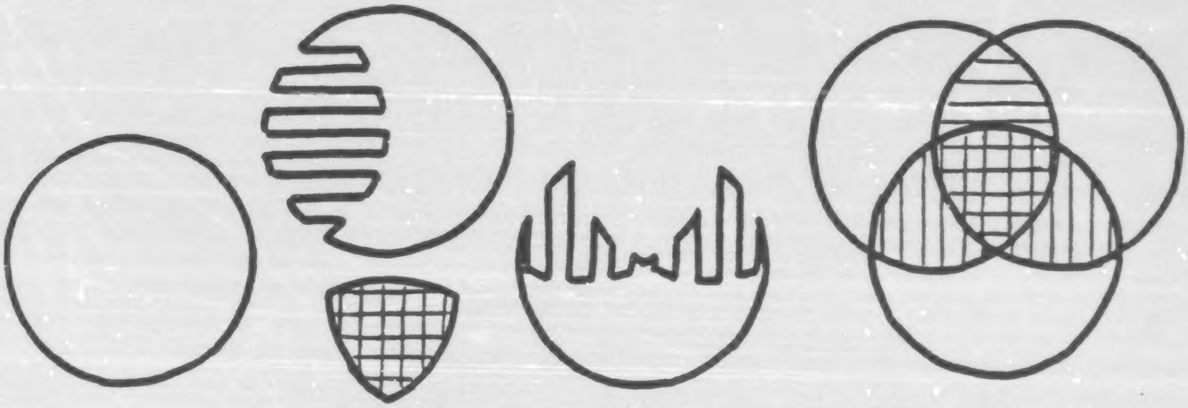
Data from; Adams, D.F. Nutritive Value of American Foods in Common Units

HANDOUT #4-2

CALORIE CIRCLES

VISUAL FOR CLASS ACTIVITY:

Visuals to use in front of the group can easily be made from either craft paper or fadeless art paper. Cut three circles, two feet in diameter, from colors which are harmonious. Keep in mind that you will be placing food models on them. Place circles on top of one another evenly, and mark the parts that overlap in one inch strips. Cut out every other strip. For the center section (#7 on Handout #4-3) where all three circles overlap, use the strips you cut out to weave a plaid section. Put black Chartpak tape around the edges of each section; add names and numbers. Laminate each part separately for easier storage. When you use the circles, put each one up individually, overlapping as you go.



DIRECTIONS FOR ACTIVITY:

Start the activity by explaining the procedures for placing foods in a section of the circles. Have the group tell you where to put margarine and sugar. Then have everyone do the rest individually before having the group suggest where you should place food models on the visuals in front of the class. Hand out answer sheets and correct.

The percentages of calories from carbohydrate, fat, and protein were figured from the listings in USDA Handbook #456, Nutritive Value of American Foods in Common Units. A food was placed in a section if at least 10% of its calories come from that nutrient. An example is below.

BEANS, DRY - 1 cup

Nutrient	Grams		Calories/ Gram		Calories		Total Calories		Percent from Nutrient
Carbohydrate	38.2	X	4	=	152.8	÷	218.7	=	69.9
Fat	1.1	X	9	=	9.9	÷	218.7	=	4.5
Protein	14.0	X	4	=	56.0	÷	218.7	=	25.6
Total	53.3				218.7				100.0

Dry beans would be placed in section 4 on Handout #4-3 representing calories from carbohydrate and protein. They are not placed in a section representing calories from fat, because the percentage is under 10.

Important: Participants should not expect that they will correctly place foods. Errors are common. Learning takes place as answers are checked.

Prepared by Barb Wilson, Wayne County ISD.

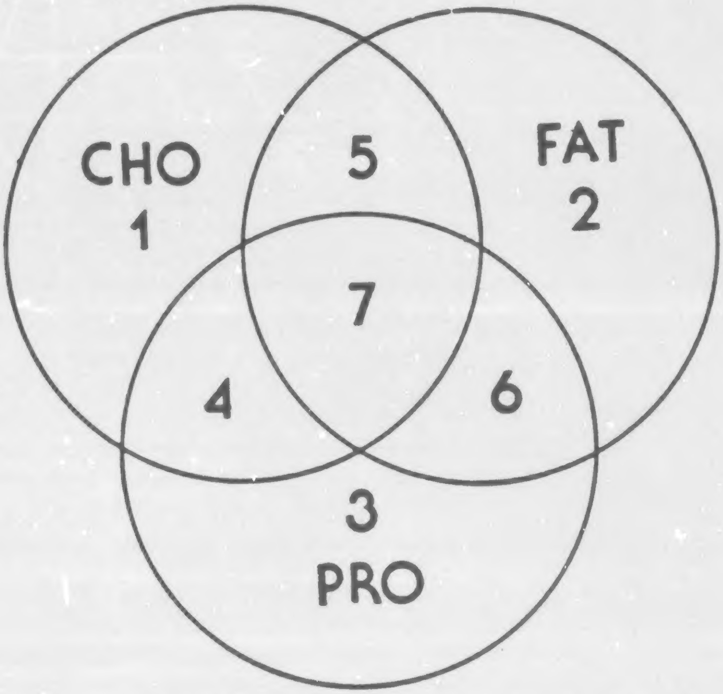
NOTES:

HANDOUT #4-3

Worksheet for participants

CALORIE CIRCLES

The diagram below has numbered sections to indicate percent of calories from carbohydrate (CHO), fat, protein (Pro), mixtures of each combination of two, and a mixture of all three.



Decide which section would be appropriate for each of the foods below, and place the number in front of the food name.

____Ground Beef
____Hot Dog, all meat
____Tuna Fish
____Egg
____Beans, dry
____Peanut Butter
____Cheese, cheddar
____Milk, whole

____Milk, skim
____Ice Cream
____Carrots
____Banana
____Corn
____Orange
____Potato, baked
____Potatoes, french fries

____Noodles
____Oatmeal
____Crackers
____Bread
____Cookie, chocolate chip
____Pie, Apple
____Salad Dressing, mayonnaise type

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HANDOUT #4-4

Answer Sheet for Instructor for
Handout #4-3

CALORIE CIRCLES

Percent of Calories from Carbohydrate, Fat, Protein

FOOD	Percent of Calories from Each Energy Nutrient			Belong in Circle Part #
	Carbohydrate	Fat	Protein	
Margarine	0.5	99.0	0.5	2
Sugar	100.0	0.0	0.0	1
Ground Beef	0.0	72.7	27.3	6
Hot Dog, all meat	2.3	81.4	16.3	6
Tuna Fish	0.0	39.1	60.9	6
Egg	2.5	65.1	32.4	6
Beans, dry	69.9	4.5	25.6	4
Peanut Butter	11.9	72.2	15.9	7
Cheese, cheddar	2.1	72.7	25.2	6
Milk, whole	30.3	48.3	21.4	7
Milk, skim	57.5	2.1	40.4	4
Ice Cream	42.3	48.5	9.2	5
Carrots	87.2	2.8	10.0	4
Banana	93.6	1.9	4.5	1
Corn	84.7	4.9	10.4	4
Orange	89.0	3.8	7.2	1
Potato, baked	88.1	1.2	10.7	4
Potatoes, french fries	51.4	42.4	6.2	5
Noodles	75.6	11.0	13.4	7
Oatmeal	69.6	16.1	14.3	7
Crackers, saltine	67.1	24.5	8.4	5
Bread	76.1	10.9	13.0	7
Cookie, chocolate chip	45.1	50.8	4.1	5
Pie, apple	62.1	34.9	3.0	5
Salad dressing, mayonnaise type	13.3	85.5	1.2	5

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HANDOUT #4- 5

ENERGY USE IN EXERCISE

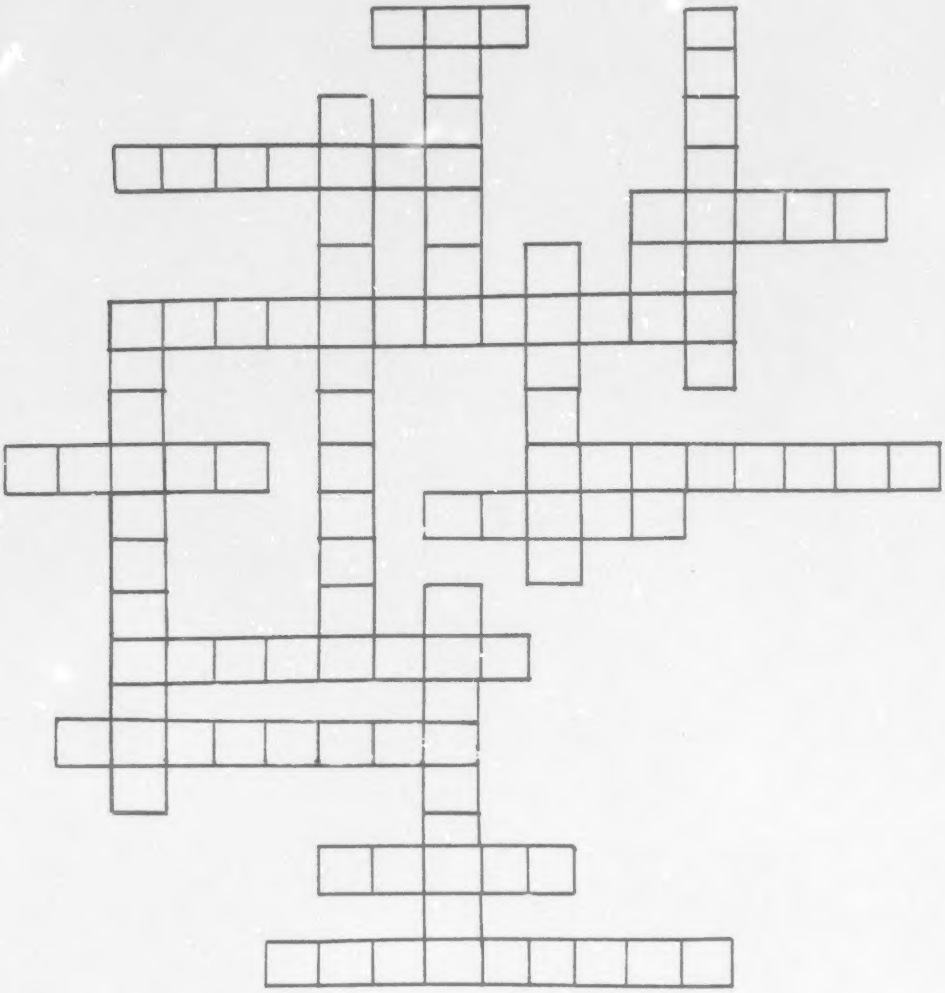
The following are some examples of the number of calories used in various activities. (Actual amounts will vary for the individual; these are only averages.)

Sitting (used as a standard or baseline; add calories from other activities to this amount for total)	100 cal/hr.
Standing	+ 40 cal/hr.
Domestic work	+ 80 cal/hr.
Walking (2½ mph)	+110 cal/hr.
Bicycling (5½ mph)	+110 cal/hr.
Gardening	+120 cal/hr.
Lawn mowing (power mower)	+150 cal/hr.
Swimming-breaststroke (½mph)	+200 cal/hr.
Chopping wood	+300 cal/hr.
Tennis	+320 cal/hr.

HANDOUT #4-6

ENERGY AND ENERGY NUTRIENTS

Using the statements on the following page, complete this Crossword Puzzle



Another puzzle:

Can you read the message: (Hint-read aloud as written).

E Z 4 N E 1 2 C Y U $\frac{\text{R}}{\text{weight}}$

U 8 N 8 N 8, NUR $\frac{\text{active}}{2}$

2 L E V 8 X S N R G!

HANDOUT #4-7

ENERGY AND ENERGY NUTRIENTS---Clues

Across:

1. Beverage containing mostly sugar is __________.
2. Name of food group including dried beans, peas, and lentils is __________.
3. Group of foods which supply sugar "naturally" is __________.
4. Name of nutrient preferred by the body for energy is __________.
5. Saturated fats tend to be __________ at room temperature.
6. __________ can help to use up excess energy.
7. Potato __________ contain mostly fat and little starch.
8. Refined foods to which four specific nutrients have been added are called __________
9. Proteins which contain all nine essential amino acids are called __________.
10. A type of carbohydrate which does not supply calories is __________.
11. Amino acids not made in the body are called __________.

Down:

3. Animal products contain more __________ than do vegetables.
4. An example of a common sterol is __________.
12. The "building blocks" of protein are called __________ __________ (2 words).
13. Name of nutrient primarily used for building and repair of body tissues is __________
14. The units used to measure energy are called __________.
15. Unsaturated fats are found primarily in __________ oils.
16. Condition resulting from eating too many high energy foods is __________.

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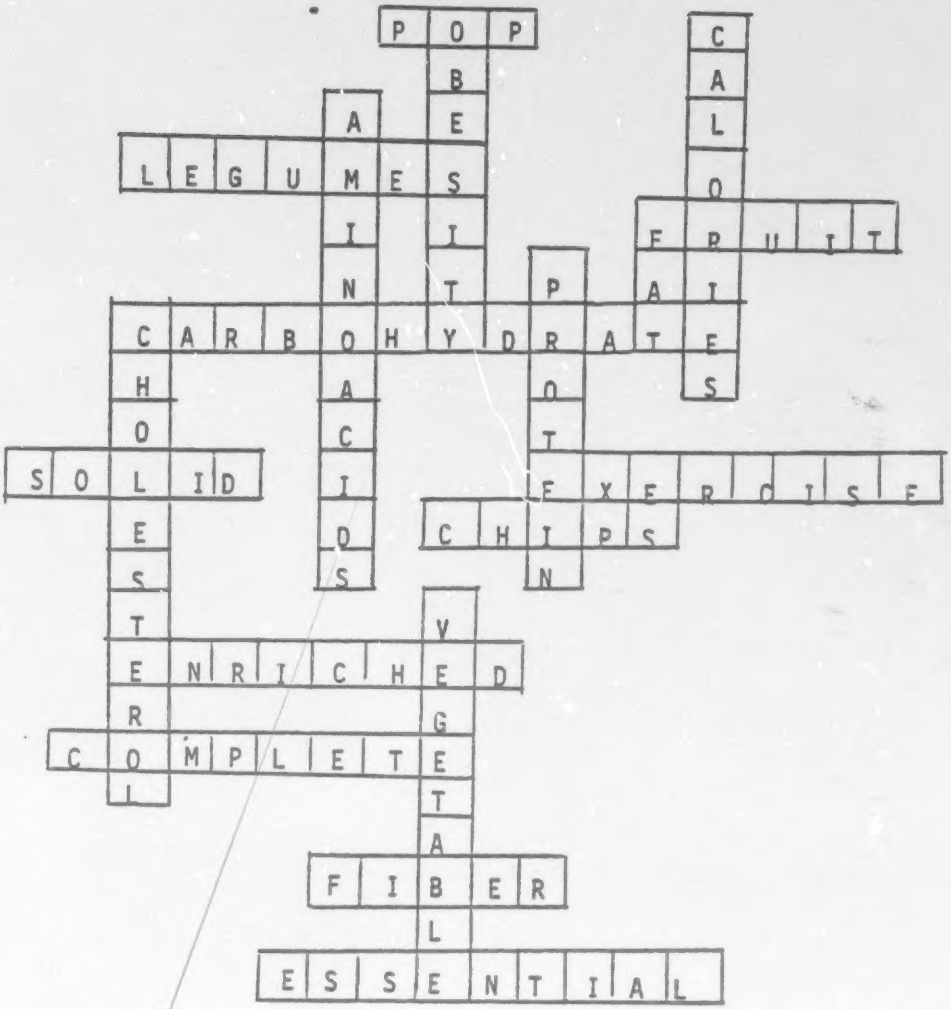
ANSWER KEY

HANDOUT #4-8

ENERGY AND ENERGY NUTRIENTS


POP
OBESITY
CALORIES
AMINO ACIDS
LEGUMES
FRUIT
FAT
PROTEIN
CARBOHYDRATE
CHOLESTEROL
SOLID
EXERCISE
CHIPS
VEGETABLE
ENRICHED
COMPLETE
FIBER
ESSENTIAL

"Another Puzzle"Answer

Easy for anyone to see why you are overweight; you ate and ate and ate, and you are too underactive to alleviate excess energy.

LESSON 5 PROGRESS TEST FOR LESSONS 1-4 ON NUTRITION

A. Goal of this lesson

Review the most important aspects of the past four lessons by administering the following Progress Test.

B. Purpose of this lesson

After completing this test the participants should be able to:

1. summarize and review the information in lessons 1-4;
2. emphasize the most important points presented in lessons 1-4; and
3. identify subject areas in which further study is needed or desired.

Note: There is no minimum score for success on this test. It is a learning activity just as the other lessons have been.

C. Instructor preparation for class progress test

1. Schedule 25 minutes for this lesson.
2. Duplicate sufficient copies of Progress Test (pages 54-58).
3. The Progress Test should be given in the following manner:
    a. Pass out copies of the progress test to each participant.
    b. Provide pens or pencils for those who may not have brought their own.
    c. Explain that the reason for this progress test is to review the important information presented in the past four lessons.
    d. Briefly go through the test together to explain the different kinds of questions to be sure that all participants know what they need to do for each question.
    e. Allow approximately 25 minutes for participants to complete the test.

f. Allow participants to keep their own test while answers are discussed.

g. State aloud which answer(s) are correct for each question.

h. Discuss how to change false statements so they read "true."

i. Lead a class discussion relating to reasons why other choices, if given, are incorrect. Ask participants to give examples of the application of each question to their school foodservice situation.

j. Allow any participants who desire to do so to retake the test on their own time.

k. Provide additional references on any topic to participants who desire further information.

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Lesson 5

PROGRESS TEST FOR LESSONS 1-4

TRUE OR FALSE: Circle the correct response.

1. T F Each nutrient can work alone to serve the body's needs.

2. T F The major role of vitamins is regulation of body processes.

3. T F Nutrition can affect physical and mental ability.

4. T F Nutrients are chemicals.

5. T F A child should have two servings of protein foods each day.

6. T F Only six amino acids are not made by the body and thus must be supplied by the diet.

7. T F The body prefers carbohydrate over protein as an energy source.

8. T F Corn and soy oil are high in saturated fats.

9. T F Cholesterol is used in brain and nerve tissues.

10. T F Fat supplies nine calories per gram.

MULTIPLE CHOICE: Circle the one best answer.

11. Which of the following nutrients does not supply energy?
    - a. carbohydrate
    - b. fat
    - c. protein
    - d. vitamins

12. Which of the following are not factors when choosing food to eat?
    - a. cost
    - b. preparation
    - c. your sex
    - d. appearance of food

13. Proteins provide _________ calories per gram.
    - a. four
    - b. six
    - c. seven
    - d. nine

14. Most carbohydrates come from __________.
    - a. meats
    - b. plant foods
    - c. seafood
    - d. dairy products

15. Which of the following is not a function of cellulose?
    - a. provides bulk in the diet
    - b. helps prevent constipation
    - c. aids in keeping digestive organs healthy
    - d. provides energy

16. An example of a visible fat is:
    - a. fried foods
    - b. marbling in meats
    - c. margarine
    - d. ice cream

17. Animal products generally provide more __________ than plant products.
    - a. protein
    - b. vitamins
    - c. minerals
    - d. carbohydrates

18. A food which supplies carbohydrates, fats and protein is __________.
    - a. potatoes
    - b. hamburger
    - c. oranges
    - d. milk

19. MATCHING: Match the following terms with their correct definitions (only one answer per blank, use each definition only once).

__________Fat	a.	a group of nutrients including sugar, starch, and cellulose
__________Amino acids	b.	a group of nutrients which serve as concentrated energy sources
__________Minerals	c.	a group of nutrients used as body builders in tissues like bones and teeth
__________Complete Protein	d.	a group of nutrients needed for growth, maintenance, and repair of body tissues
__________Carbohydrates	e.	a group of nutrients needed in very small amounts, but essential for normal body functioning
__________Nutrient Density	f.	small units which together make proteins
__________Calorie	g.	a type of protein which contains all the essential amino acids in the correct proportions
__________Protein	h.	unit used to measure energy from foods
__________Polyunsaturated fat	i.	fats which often are liquid at room temperature
__________Vitamins	j.	a method of assessing the nutritional quality of foods; the ratio of nutrients to calories

20. List three factors which affect an individual's food choices.
   1.
   2.
   3.

21. How can the school foodservice affect the child's eating habits?

22. Name five factors that determine the amounts of nutrients your body needs.
   1.
   2.
   3.
   4.
   5.

23. Give two combinations of foods which will provide a complete protein.
   1.
   2.

24. Describe two functions of protein.
   1.
   2.

25. It has been recommended that Americans reduce their fat consumption.
Discuss why.

26. Some foods are called "minimal nutrient" foods. Explain what this means, and give three examples of such foods.
   1.
   2.
   3.

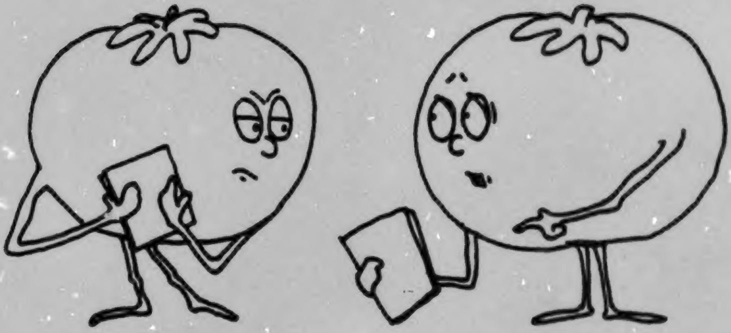
27. What are two reasons to be concerned about school children's food practices?

1.

2.

Possible Score __________

Actual Score __________



ANSWER KEY

LESSON 5

PROGRESS TEST 1

True-False: 1-F, 2-T, 3-T, 4-T, 5-T, 6-F, 7-T, 8-F, 9-T, 10-T

Multiple Choice: 11-d, 12-c, 13-a, 14-b, 15-d, 16-c, 17-a, 18-d

19. Matching: b - f - c - g - a - j - h - d - i - e

Short Answer:

20. List three factors which affect an individual's food choices.

Sensory appeal: look, taste, feel of food
Availability
Manageability
Social and cultural patterns
Emotional meanings of food

21. How can the school food service affect the child's eating habits?

The child is developing food practices, and what he/she observes at school will affect his future patterns. He can learn about balanced and regular meals, and be introduced to a variety of foods that might not be available at home. The child may also associate food with positive or negative eating experiences.

22. Name five factors that determine the amounts of nutrients your body needs.

Any five are correct:

age
sex
activity
growth

state of health
body shape and size
emotional and mental health
racial and ethnic differences
other individual differences

23. Give two combinations of foods which will provide a complete protein.

Grains and legumes or dairy products
Rice and beans
Cereal and milk
Macaroni and cheese
Many other combinations

24. Describe two functions of protein.

Growth of the body
Repair, maintenance of tissues
Energy
Resistance to disease
Regulate body processes
Maintain body fluid balance
Acid/alkaline balance of blood

25. It has been recommended that Americans reduce their fat consumption. Discuss why.

It supplies a large number of calories and this may encourage obesity. Excessive fat may increase the risk of heart disease.

26. Some foods are called "minimal nutrient" foods. Explain what this means, and give three examples of such foods.

"Minimal nutrient" means that a food supplies large amounts of calories and very few other nutrients. Examples:

sugar
alcohol
potato chips
fats
pop
candy

27. What are two reasons to be concerned about school children's food practices?

Any two are correct:
-- The family no longer is the primary group influencing children's eating habits
-- Parents do not usually seek advice on how to feed school age children
-- School may be one of the prime groups influencing children's food practices

-- Children need to learn how to make informed choices about the food they eat

-- If children form good eating habits when they are young, they are likely to keep them as an older person

FAT SOLUBLE VITAMINS: A, D, E, AND K

A. Goal of this lesson

The goal of this lesson is to assist the participant in recognizing the importance of vitamins as nutrients needed for good health and to provide information about the fat soluble vitamins, their functions and sources in the American diet.

B. Purpose of this lesson

After completing this lesson, the participant should be able to:

1. define the term "vitamin";
2. name the four fat soluble vitamins;
3. give two functions of each of the following: vitamins A, D, and E, and one function of vitamin K;
4. shown a list of foods, indicate which are good sources of specific fat soluble vitamins; and
5. recognize the importance of including vitamin-A-rich foods often in menus.

C. Instructor preparation for class activities

1. Duplicate sufficient copies of handouts.
2. Locate Comparison Cards from National Dairy Council (address listed in reference list) and other pictures of food (p. 65).
3. Order film from list (8-10 weeks in advance).
   Read the Label, Set a Better Table. Title No. 005695, National Audiovisual Center. National Archives and Records Service, General Services Administration; Reference Section HH, Washington, D.C. 20409. (14 min., 16 mm., color). Sale $95.50, rental $25.00 for 3 days (301)763-1896. Descriptors: nutrient functions, labeling, consumer education, nutrient sources. Available from FNIERC, Acc. No. 582-75.
4. Collect food samples for label-reading exercise (see page 67).

D. Key words used in this lesson

None

E. References for additional information

1. National Dairy Council (see reference list, lesson 2).

   Anon. 1979. Some Facts and Myths of Vitamins. FDA Consumer. HHS Publ. No. (FDA) 79-2117. U.S. Gov't. Printing Office.

LESSON CONTENT	CLASS ACTIVITY

A. Vitamins as a group of nutrients: What is a vitamin?

1. A vitamin is a substance found in foods and needed by the body in very small amounts for specific functions.
2. Vitamins generally are not made in the body, but are provided through foods. An exception includes certain B-vitamins made in the intestine, but even for these vitamins, the major source is foods.
3. There are two major classes of vitamins: fat-soluble and water soluble.
   a. The fat-soluble vitamins include vitamins A, D, E and K. They are usually found in fat-containing foods, and are associated with fats in general. The fat-soluble vitamins can be stored in the body instead of being excreted in the urine.
   b. The water-soluble vitamins include the B-vitamins and vitamin C. These vitamins are not significantly stored in the body, but are excreted in the urine.
4. Much is still not known about the vitamins and their functions in the body.

B. The fat-soluble vitamins

1. Vitamin A
   a. Vitamin A was the first of the vitamins to be discovered, around 1913. This vitamin can be stored in the body in

LESSON CONTENT	CLASS ACTIVITY
large amounts, and when a person takes large doses of vitamin A supplement-he/she may become ill. b. Vitamin A functions include: (1) Growth and development of the body, especially the bones and teeth. (2) Aiding in the normal development of the fetus, and helping ensure the birth of a healthy baby.	
(3) Maintenance of healthy skin and the linings of the mouth, nose, throat, and digestive organs. This helps the body to resist infections. (4) Improving the ability of the eye to see in dim light. c. Sources of vitamin A include:	Using Handout #6-1 and #6-2 answer the questions about sources of Vitamin A.
(1) Animal products such as egg yolk, butter, whole milk, cheeses, and organ meats (especially liver). (2) Deep yellow and dark green leafy vegetables such as carrots, yellow squash, spinach, and broccoli.	Use National Dairy Council Comparison Cards to compare levels of vitamin A.
(3) Some foods have vitamin A added; margarines, and low-fat or skim milk are examples. Particular foods and the levels of vitamin additions are determined by the different states.	Illustrate with foods, models, or pictures the serving sizes providing appropriate amounts of the fat-soluble vitamin A (see Handout #6-2).
2. Vitamin D a. Vitamin D was discovered and its deficiency associated with rickets (a bone deforming disease in children) in the 1920s. This vitamin is stored in the body; excesses from supplementation can be toxic, but this is a rare occurrence.	

LESSON CONTENT

b. The primary function of vitamin D is the formation and maintenance of bones and teeth by helping the body to use calcium and phosphorus.

c. Sources of vitamin D include:

   (1) Egg yolk.

   (2) Milk which is fortified with vitamin D.

   (3) Vitamin D is also produced by the body. As sunlight hits the skin, it changes a compound in the skin to vitamin D. This is why it is sometimes called the "sunshine vitamin."

3. Vitamin E

   a. Vitamin E is widely distributed in foods, and there is no known deficiency in humans. Much more needs to be learned by scientists about this vitamin. Many claims have been made about vitamin E and fertility, but these have not been proven.

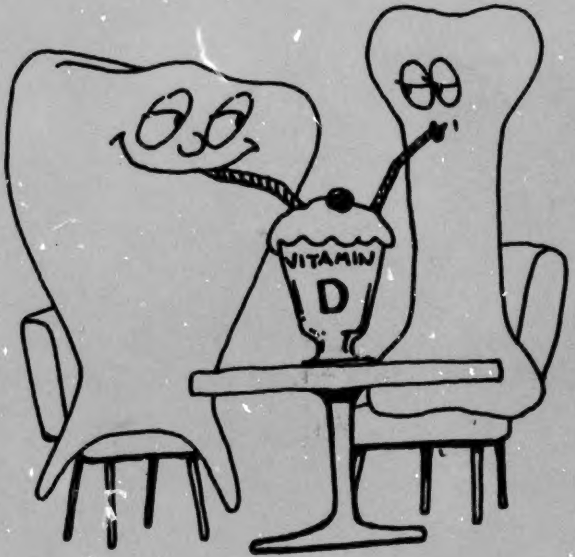
   b. The known functions of vitamin E include:

      (1) Helping to use the energy from fats and carbohydrates.

      (2) Assisting in the making of other substances used in the body.

114 (3) Protects vitamins A and C from being destroyed; it also protects fats in the body and in foods. Vitamin E is sometimes used as a preservative in oils and fats.

CLASS ACTIVITY



Show film "Read the Label, Set a Better Table." Discuss what each participant learned from the film. 115

LESSON CONTENT	CLASS ACTIVITY
4. Vitamin K a. Vitamin K is found in many foods and can also be made by bacteria in the intestines where it is absorbed. Dark green leafy vegetables are an especially good food source. This vitamin is seldom deficient in a normal diet supplying the other fat-soluble vitamins. b. Vitamin K's primary function is to assist in the formation of blood clots, thus helping to prevent excessive bleeding.	Read food labels to identify foods containing fat-soluble vitamins (dairy products, margarines, cereals are likely products). Continue Nutrition Chart from lesson 2 (Handout #2-3) by completing the information about vitamins A, D, E and K.

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HANDOUT #6-1

VITAMIN A

Using Chart #6-2 to answer the following questions.

1. 12 year old girls need how much canned peaches to receive 1/3 of their daily requirement for vitamin A?
   a) 1/3 cup
   b) 2/3 cup
   c) 1/2 cup

2. A 1 oz. portion of liver provides 1/3 of the vitamin A daily requirement for the following children:
   a) 6 year old boys
   b) 12 year old girls
   c) 16 year old boys

3. All children receive 1/3 of the vitamin A daily requirement by eating the following portion of canned carrots:
   a) 1/4 cup
   b) 1/3 cup
   c) 1/2 cup

4. One third of the vitamin A requirement for 6 year old girls and 18 year old girls can be gotten from 1/4 cup of broccoli:
   a) true
   b) false

ANSWER KEY

1. c
2. all three answers are correct
3. a
4. a (true)

HANDOUT #6-2

VITAMIN A SOURCES

Serving sizes of foods which will provide at least 1/3 of the Recommended Dietary Allowance for Vitamin A for children:

Foods for Vitamin A (Vitamin Content)	Units	4-6 yrs. Male	4-6 yrs. Female **500 mg. RE	7-10 yrs. Male	7-10 yrs. Female **700 mg. RE	11-14 yrs. Male 1000 mg RE	11-14 yrs. Female **800 mg. RE	15-18 yrs. Male 1000 mg RE	15-18 yrs. Female **800 mg. RE
Stew, beef-vegetable, canned (2,380 IU)	cup		1/3		1/2	3/4	2/3	3/4	2/3
Apricots, canned, light syrup	cup		1/4		1/4	1/2	1/2	1/2	1/2
Peaches, canned, water pack (1,100 IU)	cup		1/4		1/3	2/3	1/2	2/3	1/2
Broccoli, frozen, cooked (4,810 IU)	cup		1/4		1/4	1/3	1/4	1/3	1/4
Carrots, canned (24,600 IU)	cup		1/4		1/4	1/4	1/4	1/4	1/4
Spinach, cooked (14,580 IU)	cup		1/4		1/4	1/3	1/4	1/3	1/4
Tomato juice, canned (240 IU)	ounce		4		5	8	6	8	6
Beef liver, cooked (15,139 IU)	ounce		1		1	1	1	1	1
Milk, low fat, fortified (200 IU)	cup		2*		3*	4*	3-1/3*	4*	3-1/3*
Egg, scrambled, large (590 IU)	count		1-1/2		2	2-2/3*	2	2-2/3*	
Bran flakes with raisins, enriched (trace)	cup		trace		trace	trace	trace	trace	trace

*These are inappropriate serving sizes but the nutritive information is given to show nutrient difference.

**This amount will provide 100% of the 1980 RDA for that group.

Data from the 1980 Recommended Dietary Allowances and Nutritive Value of American Foods in Common Units, 1975.

LESSON 7 WATER SOLUBLE VITAMINS: C AND THE B-COMPLEX

A. Goal of this lesson

The purpose of this lesson is to provide information about the water soluble vitamins, their functions, sources in the American diet, and special precautions for preserving them.

B. Purpose of this lesson

After completing this lesson, the participants should be able to:

1. name six water soluble vitamins;
2. describe how to prepare foods in Child Nutrition Programs to retain water soluble vitamins;
3. when shown a list of foods, indicate which are good sources of water soluble vitamins;
4. explain the importance of using enriched and whole-grain bread and cereal products;
5. explain the importance of including vitamin-C rich foods in Child Nutrition Program menus as often as possible, and
6. list at least three functions of water-soluble vitamins.

C. Instructor preparation for class activities

1. Duplicate sufficient copies of handouts.
2. Secure comparison cards from National Dairy Council (see reference list, lesson 2), for page 72.

D. Key words used in this lesson

1. USDA LUNCH PATTERN: The food plan designated by USDA for the National School Lunch and Child Care Food Program. Designated amounts of meat/meat alternative, fruits and vegetables, bread, and fluid milk are designed to provide approximately 1/3 of the Recommended Dietary Allowances, but no actual nutritional requirements are included in the pattern. Foods must be selected carefully to provide 1/3 of the Recommended Dietary Allowances.

2. VITAMIN C: A water soluble vitamin, It is also called ascorbic acid. It is found in citrus, broccoli and cabbage, and other foods and beverages.
3. ENRICHMENT: The addition of thiamin, niacin, riboflavin, and iron to refined grain products at levels specified by law.
4. WATER SOLUBLE VITAMINS: A class of vitamins not stored in the body, but excreted in the urine. They are easily lost from food during cooking, standing in water, or when food is dried.
5. PELLAGRA: Disease related to niacin deficiency.
6. BERIBERI: Disease related to thiamin deficiency.
7. SCURVY: Disease related to vitamin C deficiency.
8. FORTIFICATION: Addition of optional nutrients (other than those specified in enrichment) to foods. For example, milk is often fortified with vitamins A and D, and salt is fortified with iodine,
9. MEAT ANALOGS: A soy vegetable, shaped and formed into a protein product resembling a meat formation.

E. References for additional information

1. Briggs, G. and D. Calloway. Bogert's Nutrition and Physical Fitness. (See reference list, lesson 3.)
2. Guthrie, H. Introductory Nutrition. (See reference list, lesson 3.)
3. Martin, E.A. Nutrition in Action (See reference list, lesson 1.)
4. National Diary Council. (See reference list, lesson 2.)
5. Anon. 1979. Some facts and myths of vitamins. FDA Consumer. Sept. 1979. HHS Publ. No. (FDA) 79-2117. U.S. Gov't. Printing Office.

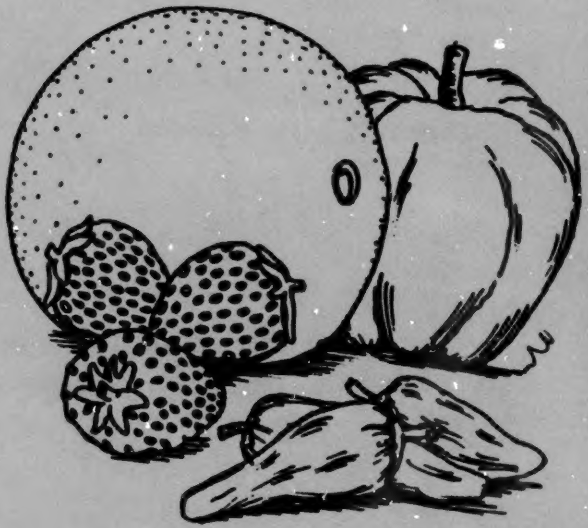
LESSON 7: WATER SOLUBLE VITAMINS

LESSON CONTENT

A. There are several water-soluble vitamins. They include vitamin C and the B-vitamins: thiamin, niacin, riboflavin, pyridoxine (B_6), folacin, and B_{12}. There may also be other water-soluble vitamins than have not been discovered yet.

1. Vitamin C
    a. Vitamin C, or ascorbic acid, is of special historical interest. Its deficiency disease, scurvy, has been known since the 15th century. In the 18th century it was known to be related to diet, and the British Navy had begun to use citrus fruits in scurvy prevention. The vitamin itself was identified in the early 20th century.
    b. The functions of vitamin C include:
        (1) Strengthening the walls of blood vessels to help prevent bleeding.
        (2) Aiding in wound healing and resisting infection.
        (3) Maintaining healthy gums.
    c. Sources of vitamin C include:
        (1) Citrus fruits, tomatoes, strawberries.
        (2) vegetables such as broccoli, peppers, spinach, and cabbage.
        (3) Fortified products such as fruit drinks.
2. B-Vitamins
    a. The B-vitamins are a group of vitamins found in many foods, but they may be easily lost during food preparation.

CLASS ACTIVITY



LESSON CONTENT	CLASS ACTIVITY
They are not stored in significant amounts in the body, and therefore deficiencies are possible. Pellagra and beriberi are two of the deficiency diseases, resulting from a lack of niacin and thiamin. In the refinement of whole grains to make white flour, these vitamins are lost, and until enrichment (or fortification) methods were developed—these diseases were common in the United States.	
b. The B-vitamins as a group have many functions in the body. Thiamin, niacin, riboflavin, folacin, and B_6 (pyridoxine) work together to perform many tasks, including: (1) Use of energy from the energy nutrients. (2) Maintenance and function of the nerves and brain. (3) Maintaining healthy skin and the lining of the mouth and nose. (4) Building new proteins, fats, and some carbohydrates. (5) Formation of blood cells.	
c. Sources of the B-vitamins include: (1) Whole grains or enriched grain products. (2) Legumes and nuts. (3) Meats, fish, poultry, eggs, and dairy products. (4) Dark green vegetables and a few fruits, including bananas, cantaloupe, and strawberries.	Using Handouts #7-1, 7-2, and 7-3 answer the questions about foods which supply at least one third of the RDA for vitamin C, thiamin, niacin, and riboflavin.
d. Vitamin B_{12} is unique among the B-vitamin family. It is essential to all cells of the body, but is especially significant in the formation of red blood cells and nerves.	Use National Dairy Council Comparison Cards to compare water-soluble vitamin content in various foods.

LESSON CONTENT	CLASS ACTIVITY
This vitamin is found only in animal products. A deficiency of B_{12} leads to a disease called "pernicious anemia." Since the requirements are minute, the average diet supplies all that is needed. Pure vegetarians (those who do not eat eggs or dairy products) have been known to be deficient. Some foods are fortified with B_{12}; vegetarians should be certain that they are using some of these foods. They include some commercial soy milks, Textured Vegetable Protein (TVP) products, meat analogues.	Continue Nutrition Chart from lesson 2 (Handout 2-3).
B. Preventing losses of water-soluble vitamins in preparation.	
1. Vitamin C and the B-vitamins can be lost in liquids used in food preparation and cooking. a. Do not soak vegetables in water for long periods during washing or crisping. b. Keep vegetables whole or in large pieces. The more surface exposed the more vitamins will be lost. c. Use cooking liquids whenever possible. They can be added to soups, gravies, sauces, or instant potatoes.	Discuss ways of reducing losses of water-soluble vitamins in your specific situation, such as steaming vegetables for a short time rather than boiling them for a longer time. Review handouts 7-4 and 7-5 about vitamin losses in food.
2. Vitamins can also be destroyed by heat. a. Try to cook in the shortest possible time. b. Using steamers or microwave ovens where available reduces both the water losses and cooking time. c. Canned vegetables need only be heated, and should not be cooked further. (Heat drained liquid, bring to boil, add	

LESSON CONTENT	CLASS ACTIVITY
vegetables, return to boil, and remove at once). d. Prepare small batches of vegetables and stagger the cooking so that the vegetables will not be on the steam table for long periods of time. e. Serve as many vegetables as possible fresh and uncooked. 3. Vitamins can be destroyed by exposure to light and air. a. Keep exposure minimal by storing in closed containers in a dark place. b. Keep cooking containers covered whenever possible. 4. Do not add baking soda to vegetables to retain the color. This procedure destroys some of the vitamins present.	

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HANDOUT #7-1

Serving sizes of foods which will provide at least 1/3 of the Recommended Dietary Allowances of water-soluble vitamins for children.

Foods for Vitamin C (vitamin content)	Units	4-6 yrs. M & F	7-10 yrs. M & F	11 - 14 yrs. M	11 - 14 yrs. F	15 - 18 yrs. M	15 - 18 yrs. F
		**40 mg.	** 40 mg.	**45 mg.	**45 mg.	**45 mg.	** 45 mg.
Orange, medium (66 mg.)	whole	1	1	1	1	1	1
Orange juice, frozen (124 mg.)	cup	1/2	1/2	1/2	1/2	1/2	1/2
Broccoli, frozen (105 mg.)	cup	1/2	1/2	1/2	1/2	2/3	2/3
Cabbage, raw shredded (42 mg.)	cup	1/2	1/2	1/2	1/2	1/2	1/2
Green peas, frozen (28 mg.)	cup	3/4	3/4	1	1	1	1
Baked potato (3 mg.)	count	1/2	1/2	3/4	3/4	1	1
Spinach, frozen (10 mg.)	cup	1/2	1/2	1/2	1/2	1/2	1/2
Milk, low fat (2 mg.)	cup						
Cheese, cheddar (0 mg.)	ounce	0	0	0	0	0	0
Bread, whole wheat (trace)	slice	trace	trace	trace	trace	trace	trace
Hamburger, lean, cooked (trace)	ounce	trace	trace	trace	trace	trace	trace

*These amounts are inappropriate serving sizes but nutritive information is given to show nutrient differences.

**This amount will provide 100% of the 1980 RDA for that group.

Foods for Thiamin (vitamin content)	Units	4-6 yrs. Male Female **0.9 mg..	7-10 yrs. Male Female **1.2 mg.	11 - 14 yrs. Male **1.4 mg	11 - 14 yrs. Female **1.1 mg.	15 - 18 yrs. Male **1.4 mg	15 - 18 yrs. Female **1.1 mg.
Bran flakes with raisins, enriched (.58 mg.)	cup	3/4	1	1	3/4	1	3/4
Spaghetti, canned with tomato sauce and cheese (.35 mg.)	cup	1	1 1/4	1 1/2	1	1 1/2	1
Beans, navy, cooked (.27 mg.)	cup	1/2	1/2	3/4	1/2	3/4	1/2
green peas, frozen, cooked (1.43 mg.)	cup	3/4	1	1 1/4	1	1 1/4	1
milk, low fat (.10 mg.)	cup						
Cheese, cheddar (.13 mg.)	ounce	30*	40*	50*	40*	50*	40*
Bread, whole wheat (.09 mg.)	slice	3*	4*	5*	4*	5*	4*
Hamburger, lean, cooked (.03 mg.)	ounce	11*	14*	16*	14*	17*	13*

*These amounts are inappropriate serving sizes but nutritive information is given to show nutrient differences.

**These amounts will supply 100% of the 1980 RDA for that group.

Data calculated from the 1980 Recommended Dietary Allowances and Nutritive Value of American Foods in Common Units, 1975.

HANDOUT #7-2

Foods which will provide at least 1/3 Recommended Dietary Allowances for Niacin and Riboflavin.

Foods for Niacin (vitamin content)	Units	4-6 yrs.	7-10 yrs.	11 - 14 yrs.		15 - 18 yrs.	
		Male Female	Male Female	Male	Female	Male	Female
		**11 mg NE	**16 mg NE	**18 mg NE	**15 mg NE	**18 mg NE	**14 mg NE
Tuna salad (10.3 mg)	cup	1/2	2/3	3/4	2/3	2/3	2/3
Hamburger, lean, cooked (1.7 mg)	ounce	2	3 1/2	4	3	4	3
Beef liver, cooked (4.7 mg)	ounce	1	1 1/2	2	1 1/2	2	1 1/2
Chicken breast, baked (.05 mg)	ounce	1	1 1/2	2	1 1/2	2	1 1/2
Peanuts, roasted, unsalted, shelled (24.6 mg)	cup	1/6	1/4	1/4	1/4	1/4	1/4
Milk, low fat (.2 mg)	cup	20*	30*	30*	30*	35*	30*
Cheese, cheddar (trace)	ounce	trace	trace	trace	trace	trace	trace
Bread, whole wheat (.6 mg)	slice	5*	6 1/2*	7 1/2*	6 1/2*	8*	6*
Apple, medium (.1 mg)	unit	40*	55*	60*	55*	65*	48*

*These amounts are inappropriate serving sizes but nutritive information is given to show nutrient differences.

**These amounts will supply 100% of the 1980 RDA for that group.

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HANDOUT #7-2 (cont'd.)

Foods for Riboflavin (vitamin content)	Units	4-6 yrs. Male Female **1.0 mg	7-10 yrs. Male Female **1.4 mg	11 - 14 yrs.		15 - 18 yrs.	
				Male **1.6 mg	Female **1.3 mg	Male **1.7 mg	Female **1.3 mg
Cottage cheese, creamed (4% fat) (.56 mg)	cup	1	1 1/2	1 2/3	1 1/3	1 3/4	1 3/4
Milk, low fat (.52 mg)	cup						
Beef liver, cooked (1.2 mg)	ounce	1	1 1/2	1 3/4	1	1 3/4	1
Bran flakes with raisins, enriched (.71 mg)	cup	1/2	3/4	1	3/4	1	3/4
Almonds, chopped, shelled (1.2 mg)	cup	1/4	1/2	1/2	1/3	1/2	1/3
Banana, medium (.07 mg)	count						
Hamburger, lean, cooked (.07 mg)	ounce	6*	6*	7 1/3*	6 1/3*	9*	7*

*These amounts are inappropriate serving sizes but nutritive information is given to show nutrient differences.

**These amounts will supply 100% of the 1980 RDA for that group.

Data calculated from the 1980 Recommended Dietary Allowances and Nutritive Value of American Foods in Common Units, 1975.

QUESTIONS ABOUT VITAMINS

HANDOUT #7-3

Using the information on Handouts #7-1 and #7-2, answer the following questions:

1. 1/3 of the RDA of niacin for 10-year old boys would be found in:
   - a) 2/3 cup tuna salad
   - b) 1 oz. fried beef liver
   - c) 1½ oz. fried chicken breast

2. 1/3 of the RDA of riboflavin for 12-year old girls would be found in:
   - a) ¼ cup almonds
   - b) 1 cup whole milk
   - c) 1-2/3 cup cottage cheese

3. 16-year old boys and girls require the same amounts of vitamin C daily.
   - a) true
   - b) false

4. A 1/2 cup of orange juice provides 1/3 of the RDA of vitamin C for 6-year old boys and 18-year old boys.
   - a) true
   - b) false

5. One cup of green peas provides 1/3 of the RDA of thiamin for the following aged children:
   - a) 6-year old girls
   - b) 8-year old boys
   - c) 13-year old girls

Answer Key

1. a. and c.
2. b. and c.
3. a (true)
4. a (true)
5. b. and c.

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VITAMIN LOSSES IN FOODS

Handout #7-4

Some of the nutrient value of foods is lost before it ever reaches the dinner table. Destruction of the more vulnerable vitamins can be avoided by following good storage and preparation practices as listed below.

VITAMIN	CONDITION	PREVENTIVE MEASURES
Vitamin C	Exposure to air	Cover when cooking or storing Prepare food just before using Don't thaw frozen vegetables before cooking
	Heat	Cook quickly in boiling water Warm canned vegetables, don't recook
	Water (Vitamin C is water soluble)	Cook in small amount of water Cook vegetables in skin Bake, braise, or steam when possible
	Crushed and bruised food (a food enzyme, activated by crushing destroys the vitamin C	Buy food free of bruises, cuts, tears. Use sharp knife Cut food just before using Handle food as little as possible
	Copper or iron (acts as catalyst - vitamin C destroyed)	Use stainless steel or aluminum pan
	Alkaline substances	Never use soda to soften vegetables
B Vitamins	Water (all are water soluble)	Cook in small amount of water Don't wash rice, don't soak beans*
thiamine (B_1)	Dry heat, high temperature	Cook breads only till brown on top Cook foods with a small surface area
	Alkaline substances	Do not use baking soda to soften dried beans or to brighten green vegetables
riboflavin	Light	Store milk in carton, not glass pitcher. Cover pot when cooking Store dried beans & grain foods in opaque, not clear, container or wrapper
Vitamin A	Light	Store in opaque container or wrapper
	Exposure to air	Cover pot when cooking Store in refrigerator
Vitamins D, E, & K	Stable to most conditions	

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*Boil 2 hrs., remove from heat and let stand for 1 hr.-equivalent to 15 hrs. soaking

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FSHN/80

Deutsch, Ronald, The Family Guide to Better Food and Better Health, Bantam Books, Chapter 16
From: Dairy Council of Michigan DCM(M#405)8/76

Dairy Council of Michigan

WHERE ARE THE VITAMINS?

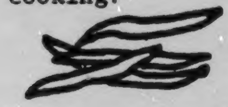
1) Check the one which has more vitamin C. Please explain your answer.

a) ____1/2 cup whole strawberries
____1/2 cup sliced strawberries
____about the same
Why? ______________________________

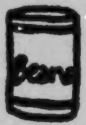
b) ____1/2 cup tomato juice
____1/2 cup tomato soup
____about the same
Why?______________________________

c) ____spaghetti sauce cooked in iron skillet
____spaghetti sauce cooked in electric fry pan
____about the same
Why?______________________________

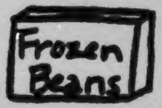
2) Which form of green beans (1/2 cup serving) would have more Vitamin C before cooking?



fresh ____

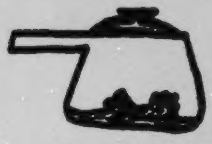


canned ____

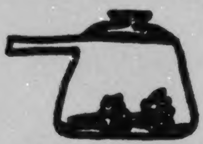


frozen ____

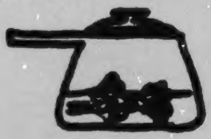
3) Check the best way to cook 1 package of frozen broccoli.



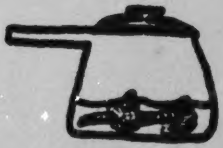
1/2 cup water
____ **10 min.**



1/2 cup water
____ **25 min.**



2 cups water
____ **10 min.**



2 cups water
____ **25 min.**

4) Some Vitamin C is lost in the cooking of potatoes - identify how under each cooking method, using the key at the right.

chips
____

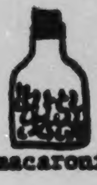
baked
____

fries
____

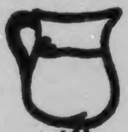
boiled
____

KEY
a. contact with air
b. contact with water
c. contact with oil
d. heat
e. light

5) How are some of the B Vitamins lost, (use the key at the right).



macaroni
____



milk
____

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LESSON 8 MINERALS AND WATER

A. The goal of this lesson is to provide information about minerals and water needed by the body, their functions, and sources in the American diet.

B. Purpose of this lesson

After completing this lesson, the participant should be able to:

1. define the term "mineral;
2. name at least six minerals needed by the body;
3. indicate which mineral is often low in diets of American school children and thus should be included often in Child Nutrition Programs;
4. list at least 4 functions of minerals in the body;
5. when shown a list of foods, indicate which are good sources of calcium, phosphorus, iron and sodium;
6. specify the importance of using iodized salt;
7. specify the importance of using whole grain and enriched bread and cereal products, and iron rich foods, and
8. discuss the value and importance of water as a nutrient.

C. Instructor preparation for class activities

1. Duplicate sufficent copies of handouts.
2. Locate Comparison Cards from National Dairy Council. (see reference)
3. Obtain foods or pictures of foods (p. 85).

D. Key words used in lesson

MINERALS: A group of nutrients used as body builders and regulators.

E. References for additional information

1. Briggs, G. and D. Calloway. *Bogert's Nutrition and Physical Fitness*. (See reference list, lesson 3)
2. Guthrie, H. *Introductory Nutrition*. (See reference list, lesson 3)
3. National Dairy Council. (See reference list, lesson 2)
4. Fenner, L. 1980. Salt shakes up some of us. FDA Consumer. March, 1980. HEW. Publication No. (FDA) 80-2129. U.S. Gov't. Printing Office.
5. March, A.C., Klippstein, R.N. and Kaplan, S.D. 1980. The sodium content of your food. Home and Garden Bulletin No. 233. USDA, U.S. Gov't. Printing Office (620-220/3642).

LESSON CONTENT

A. Minerals are a group of nutrients which make up four percent of the body's weight.

  1. They serve as building materials, especially in bones and teeth.
  2. They are used in the regulation of body functions, such as muscle action and the sending of nerve messages.
  3. Minerals help to maintain the correct levels of water in each cell.

B. Calcium and phosphorus are the most prevalent of all the minerals in the body.

  1. The [illegible]ons of calcium and phosphorus include:
     a. providing rigidity to bones and teeth;
     b. blood clotting, nerve functions, muscular action, and the absorption of vitamin B_{12}.
  2. The primary sources of calcium and phosphorus are milk, milk products, leafy green vegetables, meats, legumes, and grains.

C. Iron is a very important mineral found primarily in red blood cells, the liver, kidneys, and several other organs.

  1. The function of iron is to help carry oxygen to and carbon dioxide from the body cells through the blood.

CLASS ACTIVITY

Using the information on Handout #8-1, show appropriate serving sizes of foods supplying 1/3 of the RDA of calcium for various age groups. Select the age groups your school feeds. Using Handouts #8-1 and #8-2 answer the required questions about calcium and iron. Illustrate appropriate serving sizes of foods supplying calcium by using models, real foods, or pictures. (See Handout #8-1 for ideas.)

Use National Dairy Council Comparison Cards to compare sources of calcium and iron.

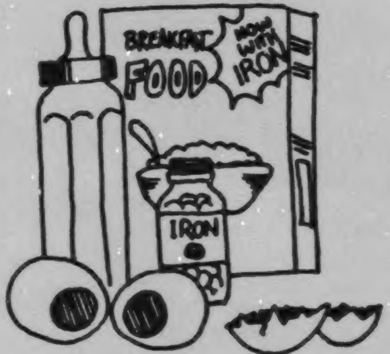
LESSON CONTENT	CLASS ACTIVITY

2. Major sources of iron include meats, legumes, and egg yolks.
3. Iron deficiency is the most common nutritional deficiency in America. The result is anemia. Women and children are the most likely victims of this deficiency. Infants over 6 months of age fed only on milk (human or cow's) may also develop anemia. It is important to give these infants iron-fortified formula, or other foods containing iron: fortified cereals, egg yolks, and meats.

D. Sodium and potassium are used in body fluids, and in tissues such as bones and nerves.

1. Together, sodium and potassium maintain the correct amount of water on the inside and outside of cells. They also help to send nerve messages, and help muscles to work properly.
2. Sodium is found in table salt, and in most processed foods. Some foods which are especially high in sodium are ham, olives, cheese, sauerkraut, potato chips, and other salty snack foods. Some sodium is found naturally in foods and softened water.
3. Potassium is found in fresh fruits and vegetables, meats, and milk.

Show samples of appropriate servings of foods supplying iron. Use Handout #8-1 for specific food ideas or see Handbook #456, Nutritive Value of American Foods in Common Units (see reference list, lesson 2).



LESSON CONTENT	CLASS ACTIVITY
E. "Trace minerals" are a group of minerals needed in very small amounts in the body. Some of these are magnesium, zinc, and fluoride. Little is known about some of these minerals, but they are, nonetheless, important. Some of the known functions of these minerals include building proteins, nerve and muscle action, normal growth, and the structure of bones and teeth. Fluoride is known to aid in preventing dental cavities.	
F. Water is an essential nutrient. The body needs water for all metabolic processes. It transports nutrients in the blood, is used to synthesize body tissues, acts as a lubricant, and helps regulate body temperature. The adult body is made up of 60% water. Our major source of water is from beverages but water is found in most foods as well. Lettuce is 96% water and milk is 87% water.	Use Handout #8-3 to discuss water content of foods.

HANDOUT #8-1

Serving sizes of foods which will provide at least 1/3 of the Recommended Dietary Allowances for calcium & iron

Foods for Calcium (mineral content)	Units	4-6 yrs.	7-10 yrs.	11 - 14 yrs.		15 - 18 yrs.	
		Male Female **800 mg.	Male Female **800 mg.	Male **1200 mg.	Female **1200 mg.	Male **1200 mg.	Female **1200 mg.
Milk, whole (288 mg.)	cup	1	1	1-1/2	1-1/2	1-1/2	1-1/2
Milk, lowfat (352 mg.)	cup	3/4	3/4	1	1	1	1
Milk, skim (296 mg.)	cup	1	1	1-1/2	1-1/2	1-1/2	1-1/2
*Yogurt, skimmed milk (294 mg.)	cup	1	1	1-1/4	1-1/4	1-1/4	1-1/4
Macaroni and cheese, canned (199 mg.)	cup	3/4	3/4	1-1/4	1-1/4	1-1/4	1-1/4
Cabbage, white mustard, cooked (252 mg.)	cup	1-1/4	1-1/4	1-2/3	1-2/3	1-2/3	1-2/3
Collard greens, cooked (357 mg.)	cup	3/4	3/4	1-1/4	1-1/4	1-1/4	1-1/4
Bread, whole wheat (23 mg.)	slice	12*	12*	17*	17*	17*	17*
Apple, medium (10 mg.)	count	100*	100*	150*	150*	150*	150*

*Not accepted as a milk serving in school lunch programs.

**These amounts supply 100% of the 1980 RDA for that group. Data from 1980 Recommended Dietary Allowances and Nutritive Value of American Foods in Common Units, 1975.

*These amounts are inappropriate serving sizes but nutritive information is given to show nutrient differences.

HANDOUT #8-1 (cont'd.)

Foods for Iron (mineral content)	Units	4-6 yrs.	7-10 yrs.	11 - 14 yrs.		15 - 18 yrs.	
		Male Female **10 mg.	Male Female **10 mg.	Male **18 mg.	Female **18 mg.	Male **18 mg.	Female **18 mg.
Chili, with beans, canned (4.3 mg.)	cup	3/4	3/4	1-1/2	1-1/2	1-1/2	1-1/2
Beef liver, cooked (2.5 mg.)	ounce	1-1/2	1-1/2	3	3	3	3
Bran flakes with raisins, enriched, fortified with iron (12.4 mg.)	cup	1/2	1/2	1	1	1	1
Beans, navy, cooked (5.1 mg.)	cup	2/3	2/3	1-1/4	1-1/4	1-1/4	1-1/4
Sunflower seeds, kernel (10.3 mg.)	cup	1/3	1/3	2/3	2/3	2/3	2/3
Spinach, cooked (4.0 mg.)	cup	3/4	3/4	1-1/2	1-1/2	1-1/2	1-1/2
Bread, whole wheat (.7 mg.)	slice	4*	4*	7-1/2*	7-1/2*	7-1/2*	7-1/2*
Apple, medium (.4 mg.)	count	8*	8*	15*	15*	15*	15*

*These amounts are inappropriate serving sizes but nutritive information is given to show nutrient differences.

**These amounts will supply 100% of the 1980 RDA for that group.

Data from the 1980 Recommended Dietary Allowances and Nutritive Value of American Foods in Common Units, 1975.

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Questions on Calcium and Iron

HANDOUT #8-2

Using Handout #8-1 answer the following questions about calcium and iron requirements for various ages of children:

1. Nonfat milk has less calcium than whole milk.

   a) true
   b) false

2. To obtain 1/3 of the RDA of calcium, 18 year-old girls must consume 1 1/2 cup of whole milk per day.

   a) true
   b) false

3. Macaroni and cheese for 6 year-old children will provide 1/3 of the RDA for calcium if served in the following portion:

   a) 1 1/4 cup
   b) 1 cup
   c) 3/4 cup

4. To get the required amount of iron for 1/3 the RDA, 18 year-old boys must eat twice as much chili as 9 year old boys.

   a) true
   b) false

5. The requirement for iron for boys and girls is never the same.

   a) true
   b) false

6. To fulfill 1/3 the RDA requirement for iron, 12 year-old girls must consume what portion of cooked navy beans?

   a) 1 1/4 cup b) 1 cup c) 1 1/2 cup

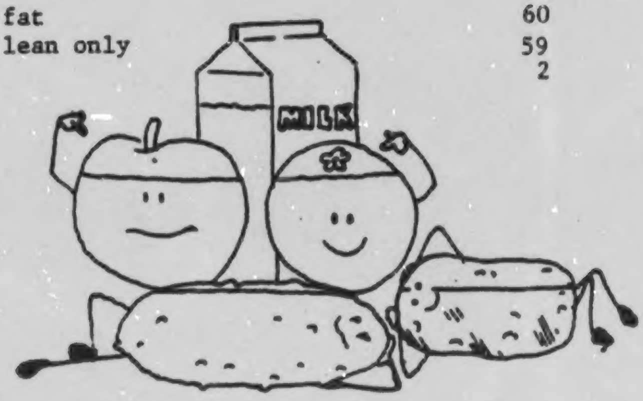
ANSWER KEY TO HANDOUT #8-2

1. b (false)
2. a (true)
3. c
4. a (true)
5. b (false)
6. a

HANDOUT #8-3

WATER CONTENT OF SOME FOODS

Vegetables:	**Percent Water**
Cucumber	96
Cooked Peas	82
Baked Potato	75
Fruits:	
Orange	86
Apricot Nectar	85
Raw Apple	84
Banana	76
Dates	23
Raisins	18
Breads/Cereals:	
Cornmeal (cooked)	88
Bread	36
Toast	25
Brownie	10
Dairy Products:	
Yogurt (whole milk)	88
Milk	88
Cocoa	79
Cheddar Cheese	37
Protein Foods:	
Chili	72
Scrambled Eggs	76
Hamburger , 10% fat	60
Broiled Steak , lean only	59
Peanuts	2



LESSON 9 SELECTING A MEAL PATTERN

A. Goal of this lesson

The goal of this lesson is to show participants how to select balanced meals to meet the nutritional needs of children and adults. Another goal is to discuss dietary guidelines for food consumption patterns.

B. Purpose of this lesson

After completing this lesson, the participants should be able to:

1. determine the RDA's for a particular age group (using an RDA chart);
2. select a day's meals to meet nutritional needs of an individual by using The Daily Food Guide; and
3. identify the dietary guidelines as described in Nutrition and Your Health.

C. Instructor preparation for class activities

1. Duplicate sufficient copies of handouts.
2. Obtain sufficient copies of Nutrition and Your Health from your Cooperative Extension Service or (see reference list).
3. Obtain copies of FOOD to use pictures of food or find other pictures for p. 94.

D. Key words used in this lesson

1. RDA: Recommended Dietary Allowance. See part A.1 in lesson for further information.
2. U.S. RDA: United States Recommended Daily Allowances. See part A.2 in lesson for further information.

E. References for additional information

1. USDA and HEW Nutrition and Your Health: Dietary Guidelines for Americans. Home and Garden Bulletin No. 232, Washington, D.C.: Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., Feb. 1980. Free.
2. Dean, A. Choosing Food for Health: A Guide to Nutrition. Extension Bulletin #E-855, Michigan State University, 1980 (see lesson 4).
3. USDA. Food. Home and Garden Bulletin #228, Science and Education Admin. U.S. Gov't. Printing Office, Washington, D.C., 20402, 1979. (Stock No. 001-000-03881-8).
4. Committee on Dietary Allowances. Recommended Dietary Allowances. Ninth Edition-National Academy of Sciences, Publication No. 2941-1, Washington, D.C. 1980.

LESSON 9: SELECTING A MEAL PATTERN

LESSON CONTENT

A. Guidelines for selecting adequate diet

1. Recommended Dietary Allowances (RDA). The RDA were originally developed in 1943 by the Food and Nutrition Board of the National Academy of Sciences, National Research Council. These recommendations are based on scientific studies of human nutrient needs. They are reviewed and updated every five years. The latest revision is 1980.
   a. The RDAs are recommendations for daily intakes of energy-calories, protein, 10 vitamins and 6 minerals. They also include estimated and safe intakes of 3 vitamins, 6 trace elements, and 3 electrolytes, about which there is insufficient knowledge to make precise recommendations.
   b. The RDAs are adjusted to the needs of 17 age/sex categories, including pregnancy and lactation.
   c. The RDAs do not address the needs of individuals; rather they are applied to groups. The amounts are designed to include an extra "margin of safety" in order to provide for the needs of almost all (96%) healthy persons.
   d. Guidelines for intended use include the following:
      (1) to serve as a guide for planning food programs for groups such as school meal programs;
      (2) to interpret food consumption information;
      (3) to establish standards for public assistance programs;
      (4) to evaluate food supply adequacy.

CLASS ACTIVITY

Use the RDA chart in Handout #9-1 to explain how to determine RDAs for different age groups. As a group, decide the RDAs for a group of 2½ year-old children. What are their RDAs for protein, vitamins A, C, and D, calcium and iron?

LESSON CONTENT	CLASS ACTIVITY
(5) for development of new food supplies and for use in food labeling; and (6) the RDA are not intended for evaluation of individual food intakes. 2. The US RDA's are legal standards used by the Food and Drug Administration (FDA) for food labeling. a. The US RDA's are based on the 1968 RDA, but only include four age/sex categories: infants 12 months and under, children ages 1-4, adults, and pregnant or lactating women. b. Amount of nutrients in foods as listed on the label are expressed as percentages of US RDA. 3. The Daily Food Guide (often called the "Basic Four") is a practical plan developed by the U.S. Department of Agriculture, designed to help consumers plan nutritious menus on a daily basis. It includes 5 groups. See Handout #9-2.	
a. Vegetable and Fruit Group: The major nutrient contributions of this group are vitamins A and C and iron. b. Bread and Cereal Group: The major nutrient contributions of this group are iron, thiamin, and niacin. c. Milk and Cheese Group: The major nutrient contributions of this group are protein, calcium, and riboflavin. d. Meat, Poultry, Fish, and Beans Group: The major nutrient contributions of this group are protein, thiamin, iron and niacin.	Use Handout #9-2 and pictures from Food to select one day's meal pattern. For example, choose foods that will equal 4 servings from the Vegetable and Fruit Group. Decide when they will be served (i.e., 1/2 cup orange juice at breakfast, 1/2 cup carrots at lunch, apple at snack, and 1/2 cup broccoli with dinner). Do this with all groups.

LESSON CONTENT

e. Fats, Sweets, and Alcohol: The major contribution of this group is calories. Unlike other groups, you need not include these every day.

B. Dietary Guidelines for Americans

The U.S. Senate Select Subcommittee on Nutrition with the help of scientists and nutritionists have suggested a set of dietary guidelines for healthy people (see reference list). Food alone cannot guarantee good health, but good eating habits based on variety and moderation can help you stay healthy, and may even improve your health.

1. Eat a variety of foods including:
    a. fruits
    b. vegetables
    c. whole grains and enriched breads, cereals and grain products
    d. milk, cheese, and yogurt
    e. meats, poultry, fish, eggs
    f. legumes (dry peas and beans).
2. Maintain your ideal weight;
3. Avoid too much fat, saturated fat, and cholesterol.
    a. Choose lean meat, fish, poultry, legumes as protein sources;
    b. Moderate your use of eggs and organ meats.

CLASS ACTIVITY

Discuss the information presented in the guidelines in Nutrition and Your Health.

LESSON CONTENT

CLASS ACTIVITY

   c. Limit your use of butter, cream, hydrogenated margarines, shortenings, and coconut oil.
   d. Trim excess fat from meats.
   e. Broil, bake, or boil rather than fry.
   f. Read labels to determine what amounts and types of fats are contained in foods.

4. Eat foods with adequate starch and fiber.
   a. Substitute starches for fats and sugars.
   b. Select foods which are good sources of fiber and starch, such as whole grain breads and cereals, fruits and vegetables, legumes and nuts.

5. Avoid too much sugar.
   a. Use less of all types of sugar--white, brown, honey and syrups.
   b. Eat less candy, soft drinks, ice cream, cakes, cookies.
   c. Select fresh fruits or fruits canned without sugar or heavy syrup.
   d. Read labels to determine amounts and types of sugars contained in foods. (sucrose, fructose, maltose, dextrose, lactose and glucose are all sugars.)
   e. How often you eat sugar is as important as how much you eat since the length of time sugar is in your mouth can be related to the development of dental caries.

6. Avoid too much sodium (salt).
   a. Learn to enjoy unsalted flavors of foods; use different seasoning.

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LESSON CONTENT

CLASS ACTIVITY

b. Add little or no salt to food at the table (it's not necessary to salt meat).

c. Cook with only small amounts of added salt.

d. Limit your intake of salty foods, such as potato chips, pretzels, salted nuts, popcorn, cheese, pickled foods, cured meats, and condiments (soy sauce, steak sauces, garlic salt).

e. Read labels to determine the amount of sodium in processed foods and snack foods.

7. If you drink alcohol, do so in moderation.

a. Alcoholic beverages tend to be high in calories and low in nutrients (1 glass beer = 114 calories; 1½ oz. whiskey = 119 calories).

b. Vitamin and mineral deficiencies occur commonly in heavy drinkers. This is due to the lack of nutritious foods eaten. Heavy drinkers fill up on alcohol before food can be consumed.

HANDOUT #9-1

Recommended Dietary Allowances (RDAs), Revised 1980

Designed for the maintenance of good nutrition of practically all healthy people in the U.S.A.
FOOD AND NUTRITION BOARD, NATIONAL ACADEMY OF SCIENCES NATIONAL RESEARCH COUNCIL

Age and Sex Group	Weight kg	Weight lb	Height cm	Height in	Protein gm	Energy in Kcal (Calories)	Range in Kcal	Vitamin A RE	Vitamin D	Vitamin C mg	Thiamin mg	Minerals Calcium mg	Minerals Iron mg
Infants:													
0.0-0.5 yr	6	13	60	24	kg x 2.2	kg x 115	95- 145	420	10	35	0.3	360	10
0.5-1.0 yr	9	20	71	28	kg x 2.0	kg x 105	80- 135	400	10	35	0.5	540	15
Children:													
1-3 yr	13	29	90	35	23	1300	900-1800	400	10	45	0.7	800	15
4-6 yr	20	44	112	44	30	1700	1300-2300	500	10	45	0.9	800	10
7-10 yr	28	62	132	52	34	2400	1650-3300	700	10	45	1.2	800	10
Males:													
11-14 yr	45	99	157	62	45	2700	2000-3700	1000	10	50	1.4	1200	18
15-18 yr	66	145	176	69	56	2800	2100-3900	1000	10	60	1.4	1200	18
19-22 yr	70	145	177	70	56	2900	2500-3300	1000	7.5	60	1.5	800	10
23-50 yr	70	154	178	70	56	2700	2300-3100	1000	5	60	1.4	800	10
51-75 yr	70	154	178	70	56	2400	2000-2800	1000	5	60	1.2	800	10
76+ yr	70	154	178	70	56	2050	1650-2450	1000	5	60	1.2	800	10
Females:													
11-14 yr	45	101	157	62	46	2200	1500-3000	800	10	50	1.1	1200	18
15-18 yr	55	120	163	64	46	2100	1200-3000	800	10	60	1.1	1200	18
19-22 yr	55	120	163	64	44	2100	1700-2500	800	7.5	60	1.1	800	18
23-50 yr	55	120	163	64	44	2000	1600-2400	800	5	60	1.0	800	18
51-75 yr	55	120	163	64	44	1800	1400-2200	800	5	60	1.0	800	10
76+ yr	55	120	163	64	44	1600	1200-2000	800	5	60	1.0	800	10
Pregnancy					+ 30	+ 300		+ 200	+ 5	+ 20	+ 0.4	+ 400	
Lactation					+ 20	+ 500		+ 400	+ 5	+ 40	+ 0.5	+ 400	

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HANDOUT #9-2

USDA DAILY FOOD GUIDE (1980)

VEGETABLE/FRUIT GROUP: 4 servings/day all persons

1 serving = 1/2 cup

Include 1 good source of vitamin C (citrus, tomato, dark green vegetables, melon)
Include 1 good source of vitamin A (dark green and deep yellow vegetables)
Include 1 good source of fiber (unpeeled fruit and vegetables, and those with edible seeds)

BREAD/CEREAL GROUP: 4 servings/day all persons

1 serving = 1 slice whole grain or enriched bread
= 1/2 - 3/4 cup cooked cereal, noodles, rice
= 1 oz. of ready-to-eat cereal

MILK/CHEESE GROUP:

2 servings/day adults
2-3 servings/day children under 9 years
3 servings/day pregnant women and children 9-12 years
4 servings/day lactating women and teens

1 serving = 8 oz. milk, 8 oz. yogurt
= 1/3 oz. cheese, 2 inch cube cheese, 2 cups cottage cheese
= 2 oz. processed cheese food, 1 1/2 cup ice cream

MEAT/POULTRY/FISH AND BEAN GROUP: 2 servings/day all persons

1 serving = 2-3 oz. cooked, lean meat, fish, poultry
= 2 eggs, 4 T peanut butter
= 1 1/2 cups cooked navy beans or lentils
= 1-2 cups nuts or seeds

Menu
Vegetables/fruit
Bread/Cereal
Milk & Cheese
Meat, Poultry Fish & Beans
Fats Sweets & Alcohol

FATS/SWEETS AND ALCOHOL GROUP: To be consumed only after recommended servings from other groups are eaten. Provides a source of additional calories.

POPULAR TOPICS IN NUTRITION

LESSON 10

A. Goal of this lesson

The goal of this lesson is to discuss popular topics in nutrition today, and to clarify them by presenting facts which the participants may use to make their own decisions. These topics are optional and may be presented as a group or singly as interests or needs dictate.

B. Purpose of this lesson

After completing this lesson (or selected portions) the participants should be able to:

1. identify arguments for or against various positions regarding diet; and
2. identify foods or food groups involved in the various issues.

C. Instructor preparation for class activities

1. Duplicate sufficient copies of handouts.
2. Collect food labels for class activity on salt (p. 112).
3. Collect vegetarian recipes for sharing (p. 113).
4. Invite a local dentist to discuss nutrition and dental disease.
5. Collect vitamin and supplement bottles for class comparisons (p. 118).
6. Obtain a copy of Safe Weight Loss from Michigan Department of Public Health (p. 104). Select from list of suggested films:

   George Gorge and Nicky Persnickity. The Polished Apple, 881 Alma Real Dr., Pacific Palisades, CA 90272 (213)-459-2630. (12 min., 60 frames filmstrip). Descriptors: food habits, nutrition education, basic four, school children (6-11 yrs.). Available from FNIERC, Acc. No. 1237-75.

   Vegetarianism in a Nutshell. The Polished Apple (84 frames, color, filmstrip and audio-cassette) ($39.75). Descriptors: vegetarianism, food beliefs, special diets, proteins, health, diet planning. Available from FNIERC, Acc. No. 1545-76 (see above for address).

Eating On the Run. Alfred Higgins Productions, 9100 Sunset Blvd., Los Angeles, CA 90069. (15 min., 16mm., color). (3-day rental: $30.00; purchase: $267.00). Topics covered are typical to teenagers and young adults: how to get balanced meals and snacks in a short time. Practical suggestions are given for quick nutritious meals. 1975. Available from FNIERC, Acc. No. 182-75.

The Fad Diet Circus. Sterling Educational Films, 241 E. 34th St., New York, NY 10016. (212)683-6300. (14 min., 16mm., color). purchase: $238.00. Weight control: discusses "unbalanced" and fad diets and compares them to good weight control programs. 1975. Available from FNIERC, Acc. No. 114-77.

D. Key words used in lesson

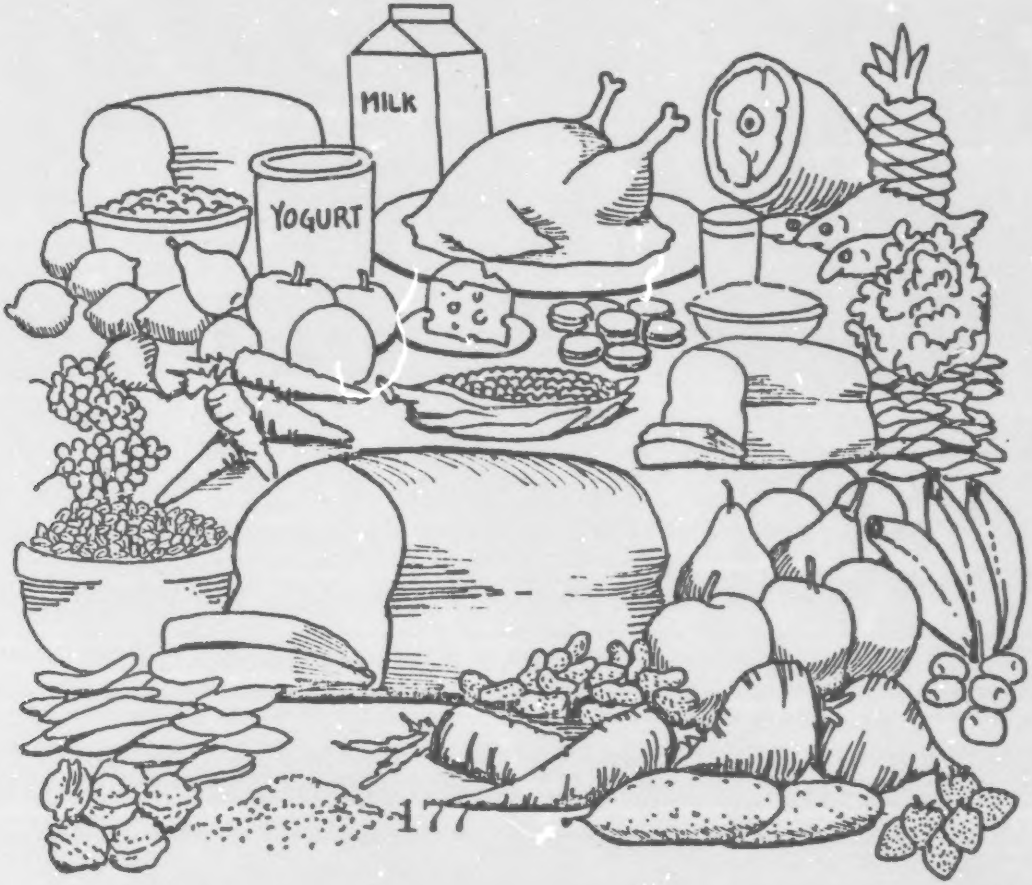
1. TVP: Textured Vegetable Proteins.
2. DENTAL DISEASES: Includes dental cavities as well as gum disease.
3. ANOREXIA NERVOSA: Illness (usually found in adolescent girls) in which the person refuses to eat and may actually starve to death.
4. NATURAL VITAMINS: Vitamins occurring normally in foods.
5. SYNTHETIC VITAMINS: Vitamins made in the laboratory. They are usually added to foods or combined in vitamin supplements.
6. VITAMIN SUPPLEMENTS: Vitamin pills.
7. CARBOHYDRATE LOADING: Consuming a large amount of high-carbohydrate foods. Often suggested for athletes before an athletic event.
8. HYPERTENSION: High blood pressure. It is not a disease, but rather a symptom.
9. HYPERKINETIC: Disorder (behavior usually seen in children) manifested in excessive gross motor activity, impulsiveness, low tolerance to frustration, short attention span, and easy distraction.

E. References for additional information

1. Adams, D.F. Nutritive Value of American Foods in Common Units. (See reference list, lesson 2)
2. Guthrie, H. Introductory Nutrition. (See reference list, lesson 3)

3. Nutrition Today, Nov. 1979. Articles on athletes and diet: Hanley, Daniel F., "Athletic Training and How Diet Affects It." Vitousek, Sharon, "Is More Better?" Hursch, Laurence, "Practical Hints about Feeding Athletes". Hanley, Daniel F., "Basic Diet for Athletes".

4. Want To Lose Weight? Do It Safely. 1979. Michigan Department of Public Health, 3500 N. Logan St., Lansing, MI 48914.



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5. Shaping Up for the Long Run. Pamphlet, Best Foods, Nutrition Information Service, Box 307, Coventry, CT 06238. (Single copy free, 25¢ for additional)

6. National Advisory Committee on Hyperkinesis and Food Additives. 1980. The National Advisory Committee on Hyperkinesis and Food Additives. Final Report to the Nutrition Foundation. The Nutrition Foundation, Washington, D.C. 20006.

7. Lehman, P. 1979. More than you ever thought you would know about food additives. FDA Consumer. HHS Publ. No. (FDA) 79-21115. U.S. Gov't. Printing Office.

8. American Dental Association. 1980. Diet and Dental Health. Bureau of Health Education and Audiovisual Services. Am. Dental A., 211 East Chicago Ave., Chicago, IL 60611. 12-page pamphlet (free).

LESSON CONTENT

A. Weight control

1. Why be concerned about weight?
   a. Overweight (obesity) has been identified as a risk factor for several chronic diseases including:
      (1) diabetes (high blood sugar);
      (2) coronary heart disease; and
      (3) hypertension (high blood pressure).
   b. "Overweight" may not always mean "over fat." Some persons may weigh more than the "ideal weight" on some charts, but still not be obese, or over fat. Athletes, for example, have more muscles which causes them to weigh more. We are concerned in this lesson with being over fat.
   c. Many people are concerned about their physical appearance. Our American culture puts a high value on slimness as a part of "beauty," especially for women.
   d. There is an increasing interest in physical fitness in general; achieving and maintaining normal weight is part of physical fitness. Physical activity also is easier when one is not obese.

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2. Controlling weight.
   a. The key to weight control is balancing the amount of energy (calories) taken in with that used up in body functions and activity.
   b. There are two sources of energy intake:

CLASS ACTIVITY

Show film, "Fad Diet Circus" (see film list). After the film has been shown, ask each participant to identify 1 or 2 new or important ideas or facts they learned from the film. Discuss these together.

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LESSON CONTENT

(1) Food and non-alcoholic beverages (Proteins and carbohydrates supply 4 calories/gram of food. Fats supply 9 calories/gram of food.)

(2) Alcoholic beverages (alcohol provides 7 calories/gram)

c. There are three ways of using up energy:

(1) Body metabolism and functions

(2) Body heat (when one has a fever, more energy is used up)

(3) Exercise, physical activity

3. There are three options available for losing weight.

a. Decrease caloric intake by eating less. This is the traditional "dieting" approach. Intake must be decreased to a level less than energy used. With time the body will adjust to the decrease, and calorie consumption must be further lowered. A diet should be planned carefully with a trained dietitian or a trained nutritionist.

b. Increase use of calories by regular exercise. During exercise more calories are used. There is also an increase in body metabolism for several hours after exercise which uses more extra calories. Before beginning an exercise program, one should check with a physician to determine what type of exercise would be safe.

CLASS ACTIVITY

Discuss Want To Lose Weight? Do It Safely (see reference list)

Show Eating On the Run. Discuss other ways to eat on the run.

LESSON CONTENT

c. The ideal way to lose weight is to combine a balanced, low-calorie diet with a regular exercise program. By doing this, there are less restrictions on food intake; the exercise helps to keep metabolism high, thus using energy more efficiently.

4. Weight control diets.

   a. Starvation diets

      (1) Hazardous due to extreme weakness and fatigue that occurs during diet.

      (2) Short term effect may be substantial weight loss, due to loss of sodium and water.

      (3) Long term effects show few patients able to maintain the weight loss.

   b. High protein, high fat, low carbohydrate diet; such as Dr. Atkin's Diet Revolution or the Drinking Man's Diet or Dr. Stillman's Diet. This diet allows an individual to eat as much protein and as much fat as desired. Carbohydrates are limited to a small amount of about 50 grams. By limiting carbohydrates, the individual will naturally decrease the number of calories consumed (protein and fat intake does not usually increase enough to make up for lost carbohydrate calories).

      (1) Hazardous due to the buildup of high levels of triglycerides and cholesterol in the blood; both of which are risk factors in coronary heart disease and arteriosclerosis.

CLASS ACTIVITY

Evaluate a weight control diet by using Handout #10-1.

(2) Short term effect may be substantial weight loss due to loss of sodium and water.

(3) Long term effects show few patients able to maintain the weight loss.

c. Diet pills (appetite depressants)

(1) Pills are usually harmless, but very costly.

(2) Short term effect may be substantial weight loss due to loss of sodium and water.

(3) Long term effects show few patients able to maintain the weight loss.

d. Liquid protein diet, known by many names as well as the Last Chance Diet. This diet combines the fasting diet (no food except water) with the consumption of a very low calorie, high protein liquid formula drink. No other foods are included.

(1) Very dangerous for some people due to the very low calorie content of the protein diet.

(2) A number of deaths and severe illnesses may have been associated with this diet.

5. Underweight.

Some people may wish to gain weight.

a. Additional calories may be consumed in two ways:

(1) Increase quantity of foods consumed; either increase number of meals eaten or increase amount of food eaten at each sitting.

LESSON CONTENT	CLASS ACTIVITY

(2) Use more high-calorie foods. The foods should not replace other nutritious foods, but may be used in addition to them. "Minimal nutrient" foods should not be used excessively. For example, milk shakes (a higher calorie milk product) could replace skim milk or a hamburger (a higher calorie protein food) could replace broiled fish.

b. Underweight may also be found in school age individuals.

  (1) Some people may try to control their weight at an undesirably low weight level. This can lead to a serious illness called "anorexia nervosa."

  (2) The child nutrition program personnel may be in an ideal position to identify individuals at nutritional risk. Some indications to look for include:

    (a) Child not eating.

    (b) Fainting spells or weakness.

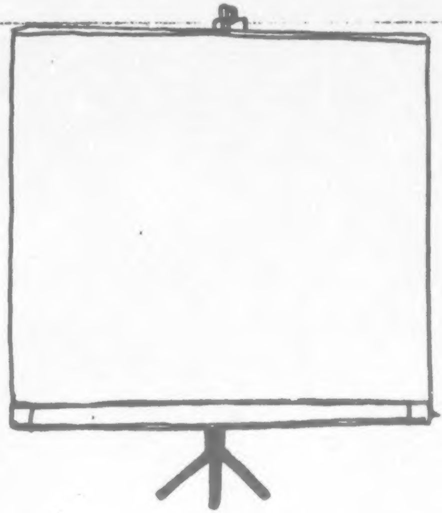
    (c) Excessive thinness.

  (3) If a customer's behavior indicates a possible nutritional problem, the situation should be referred to the appropriate teacher or the school nurse.

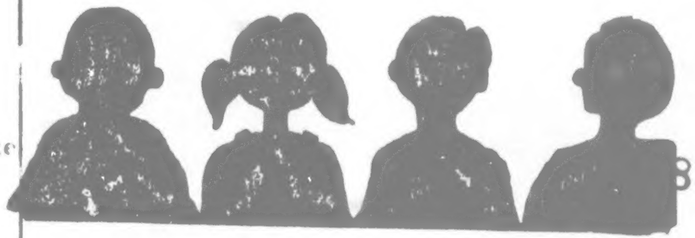
6. The role of school food service in weight control.

  a. The role of the school foodservice is to provide appropriate food choices to supply the energy needs of the customers.

  b. Three aspects of nutrition affect appropriate food choices for weight management.



Use suggested film from film list, George Gorge and Nicky Persnickety. Discuss how this filmstrip could be used with primary school children to encourage good eating habits.



LESSON CONTENT	CLASS ACTIVITY
(1) Quality foods with high nutrient value and low calories are good choices for everyone, but especially those who wish to lose weight. "Minimal nutrient" foods should be avoided. (2) Quantity portion control is already "built-in" to the school menu patterns. The individual customer may wish to decrease or increase the amount he/she eats. (3) Nutrition education is a useful tool to show customers what nutrients and how many calories are present in foods served in the school meal program.	Discuss with participants any particular problems they have observed in their schools concerning children who appear very thin and underfed, or children who continue to gain too much weight, or children with dental problems, or girls who are constantly dieting.
B. Additives 1. Food safety a. The use of additives in the food supply is the subject of many laws. Very strict regulations govern the type and amount of additives that may be used. Additives are constantly being studied and tested by the Food and Drug Administration (FDA) in order to establish their safety or potential danger, and what amounts would be safe or harmful.	
b. Most substances can be harmful or toxic if consumed in excessive amounts. This is true even of nutrients themselves, but that is not reason enough to ban their consumption. By consuming a diet containing a wide variety of foods, "natural" and processed, one can avoid an excess of any specific additives.	Allow for discussion of these controversial subjects.

LESSON CONTENT

2. Adverse reaction to additives.
   a. There has been much publicity about behavior problems in school age children due to the ingestion of additives in the food supply. Dr. Feingold's Diet states that the ingestion of artificial colors and flavors in foods adversely affects the behavior of some children (hyperkinetic children). When these additives are removed from the diet, Dr. Feingold claims that there is improvement in the behavior of the children. Research has been unable to substantiate that this diet alone is responsible. There are other factors involved in the diet that aid in the behavior changes.
   b. Everyone is quite different in relation to one's sensitivity to certain chemicals in foods. Not only are some people sensitive to synthetic additives, but also some others are sensitive to naturally occurring chemicals. People working with food should be aware of such human peculiarities.
   c. The National Advisory Committee on Hyperkinesis and Food Additives stated there is no link between hyperactivity and diet. There is no direct causal link between artificial colors or artifical flavors and hyperactivity. No link was found between artificial additives or natural salicylates and hyperkinesis.

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3. Sugar.

   Sugar, as discussed in this section, will be defined as

CLASS ACTIVITY

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Distribute Handout #10-2, "Bee Centsible". Discuss its contents.

table sugar or sucrose. There are many other naturally occurring sweeteners in our diet, which will not be discussed. Sucrose is a simple carbohydrate and supplies calories just as other carbohydrate foods do. Sugar consumption is a concern to many nutritionists and physicians today. The consumption of sugar has been linked to many disease conditions. We will discuss some of them.

1. Sugar and dental disease.
   Dental disease is one of the few diseases that is directly affected by sugar consumption. Sucrose, a simple carbohydrate, does significant damage to teeth when the environment in the mouth is right (see Section F in this lesson on dental disease).
2. Sugar and obesity.
   Sugar is a culprit in obesity simply because it contains calories. The basic cause of overweight is an excess of calories in the diet. Many overweight people tend to eat many foods with a sweet taste, which are sugar foods (food with a high percentage of sugar). A good weight reduction plan would restrict the sugar food, thus lowering the intake of calories.
3. Sugar and diabetes.
   Sugar is connected to diabetes by way of obesity. There is a greater risk for an individual to become diabetic if he/she is overweight (see above, Sugar and Obesity, for the connection).
4. Sugar has been cited as a cause for several other diseases

LESSON CONTENT	CLASS ACTIVITY

as well: coronary heart disease, hyperkinesis, and hypoglycemia. Research has not been able to show clear evidence that sugar is a contributing factor in these diseases.

D. Salt

There has been much concern about salt consumption in the last several years. Salt, also known as sodium chloride, is an essential nutrient in the human diet. Sodium retains water for the body's use. The concern is with excess sodium in the diet, because excess sodium will retain excess water, which may aggravate a high blood pressure condition. High blood pressure (Hypertension) is a risk factor in heart disease.

1. Most foods contain sodium naturally. When excess sodium is a concern-the addition of sodium to food should be watched.
   a. Many processed foods contain large amounts of salt: for example, condiments such as pickles and ketchup, snack foods like potato chips and salted nuts, and foods which require salt in processing such as ham, sauerkraut and olives.
   b. In addition to these sources, many people add salt to foods in cooking, and also at the table. There is not a recommended dietary allowance for sodium. In 1980, the Food and Nutrition Board suggested that adults can ingest 1100-3300 mg/day and have both safe and adequate intakes. The range for school age children is 750-2700 mg. Most Americans exceed this intake that can be translated for adults as 3-6 grams (1t) of salt per day.

Read food labels to identify hidden sources of salt such as canned foods, vegetables, soups, or TV dinners. Ask each participant to bring one example to the next class.

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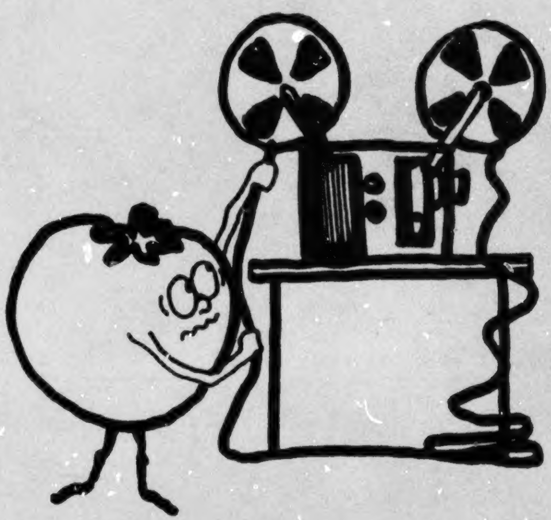
LESSON CONTENT	CLASS ACTIVITY

2. Suggestions for lowering salt intake.
   a. Remove the salt shaker from the table.
   b. Limit the use of foods high in sodium (see list above).

E. Vegetarianism

1. Types of vegetarianism.
   a. Lacto-ovo vegetarianism is a diet of plant foods plus dairy foods and eggs.
   b. Lacto vegetarians use plant foods and dairy foods but no eggs.
   c. Strict vegetarians, often called "vegans," use no animal or animal products at all; only plant foods are consumed.
2. Planning a balanced vegetarian diet involves the same principles used in other diets: a variety of foods can supply the adult with all his nutrient needs. Following is a summary of the basic food groups for adult vegetarians.
   a. Fruits and vegetables: 4 servings/day. Emphasis should be on choices high in iron.
   b. Breads and cereals: 4 servings/day. These should be whole grain whenever possible.
   c. Milk or milk products: 2 servings/day. (If vegan, substitute 2 servings of a B_{12} fortified soy milk.)
   d. Protein foods: 2 servings/day. These include legumes, nuts, seeds, peanut butter, and eggs (if not vegan). TVP and other meat analogues also provide protein.

Show the film, "Vegetarianism in a Nutshell." Discuss what information in the film was new and of interest to participants.



LESSON CONTENT

3. Potential problems of vegetarianism.
   a. Calories may be low. For some adults this may be desirable. For children it could interfere with normal growth and development.
   b. Vitamin D may be low, particularly for vegans. This may also interfere with bone growth in children. Consuming several servings daily of milk and milk products can prevent this. This can be a serious problem for school age children.
   c. Iron may be low. Legumes, dark green vegetables, and dried fruits help to provide iron.
   d. Vitamin B_{12} intake may be low. Vitamin B_{12} is mainly found in animals, animal products like milk and eggs, soy milk products and, meat analogues that have been fortified. Vegans must be careful to consume enough of these foods to avoid a deficiency. Vitamin B_{12} is an essential nutrient that we must get from foods we eat. Without vitamin B_{12} an individual may develop pernicious anemia, which may lead to nerve damage. This is a particular concern for children.
   e. Strict vegetarianism is not recommended for children. Research has shown that some vegetarian children develop rickets and anemia and fail to thrive, grow, and develop. The use of milk and eggs can help to prevent these problems. Even with the lacto-ovo vegetarian diet, however, much care must be taken to provide a wide variety of foods to ensure good nutrition. Calories, trace minerals, iron, calcium, vitamin B_{12}, and vitamin D are key nutrients to consider.

CLASS ACTIVITY

Share recipes appropriate for vegetarians. Taste some vegetarian dishes. Taste some of the meal analogues and discuss ways to use these in the school meal program.

LESSON CONTENT	CLASS ACTIVITY
F. Athletics	
1. Diet in general.	
a. Athletes should eat a balanced diet consisting of a variety of foods.	
b. Some modifications in diet may be necessary (see section below)	
c. Excessive weight reduction during training is not recommended. During weight reduction, water is also lost from the body. Water loss greater than 3% of body weight will lead to fatigue and a lower level of performance.	Use articles on Athletes and Diet in *Nutrition Today*, Nov. 1979, to expand on these facts.
2. Significant nutrients.	
a. Energy requirements are higher because of the increased activity level. Eating a balanced diet which provides sufficient calories will usually supply the other nutrients as well.	
b. Water is of special importance to the athlete. Without sufficient water the athlete quickly may become dehydrated. Water affects endurance; drinking plenty of water can actually increase it, while insufficient amounts may decrease endurance.	
c. Protein has often been regarded as being needed in large amounts by the athlete. This is not true. The athlete needs protein in similar amounts to non-athletes. There are some dangers associated with a high-protein diet. It encourages dehydration, thus it may cause problems with water balance in the body and may lead to kidney damage.	

LESSON CONTENT

CLASS ACTIVITY

d. Carbohydrate is the most efficient energy source for the body. While "carbohydrate loading" (diet very high in carbohydrates) just prior to the athletic event is not necessary, a balanced diet with a high amount of carbohydrates during training may improve endurance. This is usually due to the added calories.

e. Vitamins and minerals are not needed in greater amounts than for the non-athlete. A diet providing sufficient calories will provide enough of these other nutrients. Some coaches believe that athletes need extra salt due to the extra water loss through sweating. Research has not shown any improvement in athletic improvement with the use of salt tablets.

G. Dental disease

1. Dental disease is the most widespread of all chronic diseases. Almost 100% of Americans have some form of dental disease.

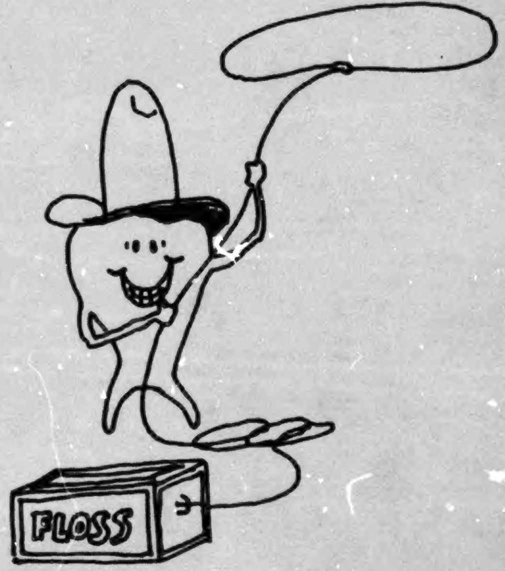
Invite a local dentist to discuss nutrition and oral health.

2. There are many factors involved in dental disease. They include:
   a. Heredity.
   b. Shape and alignment of teeth.
   c. Chemistry of saliva.
   d. Diet. This is a controllable factor.

LESSON CONTENT

3. Development of dental disease involves four main factors.
   a. Tooth susceptibility. This factor is directly affected by diet. Several minerals are essential in protecting the tooth from decay including calcium, flouride, magnesium, and phosphorus. Vitamin D is also important to healthy tooth development.
   b. Bacteria that normally live in the mouth. Many of these bacteria secrete acids which can erode the enamel (protective coating) of the teeth.
   c. Carbohydrates. These are used by the bacteria as food, which enables them to secrete acid.
   d. Time of contact with food. The risk of cavities increases with increasing length of contact. This is especially true of sugary foods.
      (1) Time of contact is increased by eating "sticky" carbohydrate foods (caramels,for example), and snacking without brushing afterwards.
      (2) Contact can be decreased by regular brushing, and by avoiding sticky foods.
4. There are two parts to prevention.
   a. Good diet for healthy tooth development.
      (1) Diet during pregnancy affects the tooth development of the fetus.
      (2) Diet in infancy and childhood aids in further development of teeth, and begins prevention of tooth decay.

CLASS ACTIVITY



LESSON CONTENT	CLASS ACTIVITY
b. Proper care of teeth and gums. (1) Brushing and flossing regularly is a major preventative measure. (2) Avoid snacking, especially of sweets and sticky foods. (3) Fluoridation of local water supplies can decrease cavities by up to 60%. (4) Regular visits to the dentist.	
H. Nutritional supplements 1. Vitamins. a. Many people seem to feel that if "some is good, more is better." This is not true. Any substance can be harmful if taken in abnormally large amounts--even water. Vitamins are no exception. b. Over 4,000 cases of vitamin poisoning occur each year, including over 3,000 children. The fat-soluble vitamins are more likely to cause poisoning because they are not readily excreted from the body. Water-soluble vitamins can also cause poisoning if taken in very large amounts (refer to lessons 6 and 7).	Bring in a few bottles of vitamin supplements. Read the labels to determine the amounts of each vitamin included. Compare amounts of vitamins in supplements with the RDA of each vitamin for children and adults. Use Handout #9-1.
c. Vitamins found in foods eaten in normal amounts will not cause toxicity. Problems generally occur when large doses of vitamin supplements are ingested. Care should be taken to keep all medications including nutritional supplements out of the reach of children. Never take more than the recommended dosage as stated on the label.	Ask participants to write down what they might typically eat in a day's menu. Select 2 or 3 vitamins and calculate vitamin amounts by using the resource Nutritive Value of American Foods in Common Units. (See reference list)

LESSON CONTENT	CLASS ACTI
d. The only diseases that vitamins can cure are the vitamin deficiency diseases. A balanced diet generally supplies enough vitamins to prevent these diseases without supplementation. e. There has been much discussion about "natural" and "synthetic" vitamins. The human body cannot distinguish between the vitamin naturally found in foods and the vitamin found in supplements. The difference is the cost. Buying vitamin supplements is an unnecessary expense, when eating a variety of foods will supply all necessary nutrients. 2. Minerals a. The same principles discussed above for vitamins apply also to minerals. Iron supplements particularly cause problems when taken in excessive amounts. b. Trace mineral supplements are becoming increasingly popular. Much needs to be learned about these nutrients. There may be dangers associated with excessive doses that are not fully understood. 3. The basic requirement for good nutrition is a well-balanced diet containing a wide variety of foods. Barring abnormal disease or genetic problems, a balanced diet can supply one's nutritional needs without supplementation. Physicians can assess one's needs for vitamin or mineral supplements and recommend them when necessary.	

HANDOUT #10-1

DIET EVALUATOR

How do you determine if a weight control diet is safe and effective? Check the next weight control diet you see using the diet evaluator provided below. The more yes answers you get, the more likely the diet is a well-devised approach to weight control.

		YES	NO	LACK INFORMATION
1.	Does the diet meet your nutritional needs for all nutrients while lowering calories?	___	___	___
2.	Are foods the basis of the diet instead of diet pills or supplements?	___	___	___
3.	Are "forbidden" foods kept at a minimum?	___	___	___
4.	Is suggested weight loss kept at no more than 1-2 pounds per week? (1000 fewer calories per day for 1 week results in a weight loss of about 2 pounds per week.)	___	___	___
5.	Does the diet contain a sensible balance of protein/carbohydrate/fat?	___	___	___
6.	Does the diet emphasize portion control?	___	___	___
7.	Is the diet based on lowering daily calorie consumption?	___	___	___
8.	Can you afford the diet?	___	___	___
9.	Are healthful snacks allowed?	___	___	___
10.	Is exercise part of the diet plan?	___	___	___
11.	Does the diet plan suggest you consult with your doctor?	___	___	___
12.	Does the diet have long term possibilities-- can you follow it long enough to reach your desired weight?	___	___	___
13.	Are you learning how to eat for the rest of your life for permanent weight control?	___	___	___
14.	Does the diet leave you with a satisfied feeling and not too hungry or tired?	___	___	___

	Yes	No	LACK INFORMATION
15. Is the diet plan easy to follow, whether at home or away, without making you feel "different"?	___	___	___
16. Is the plan easily adaptable if you find yourself at an unscheduled place during mealtimes?	___	___	___

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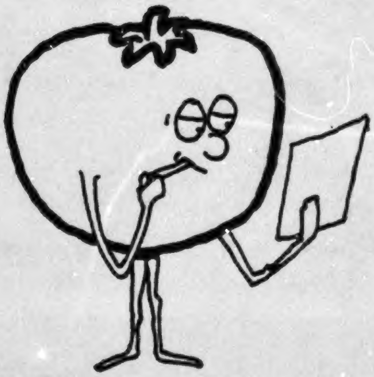
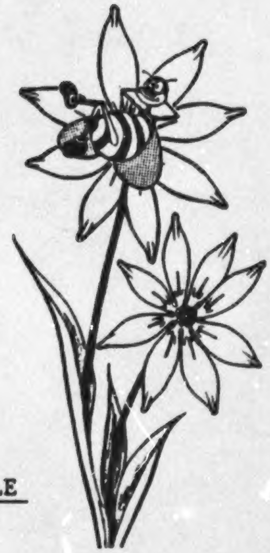


HANDOUT #10-2



BEE CENTSIBLE

Health and natural foods are in the spotlight today. According to their definitions, health and natural foods are actually no different than the foods we eat everyday! Health food is defined as food that promotes good health. A food that has any nutrients at all may promote good health. Natural food is defined as food in its natural form. Fresh fruits, vegetables, meats, eggs, and milk are all natural foods!

A natural sweetener such as honey is often used in foods in order to promote better health. Honey is a fine sweetener, but as compared to granulated sugar, it is little better nutritionally (see chart) than granulated sugar. Honey has some disadvantages. It is much more expensive than sugar. Because it is so sticky, it provides a good environment for the growth of dental caries. If you are counting calories, don't choose honey! It contains 18 more calories per tablespoon than granulated sugar.

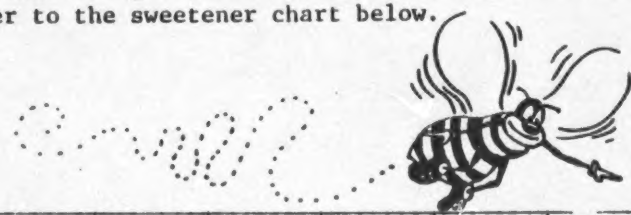
No sweetener is considered to be a good source of anything but carbohydrate. For example, honey and crude brown sugar have high amounts of riboflavin, as compared to other sweeteners. However, these sweeteners have very small amounts of riboflavin, considering the RDA (Recommended Daily Allowance) for riboflavin for the adult male is 1.7 milligrams. Many other foods are much higher in riboflavin than honey or crude brown sugar, such as one cup of milk (.3 milligrams), one half-cup of broccoli (.3 milligrams), and 1 egg (.15 milligrams).

Maple syrup is a much better source of calcium than imitation maple syrup. However, pure maple syrup is much more expensive than imitation. Why pay the high price, when a cup of milk which can be consumed at the same meal provides 300 milligrams of calcium?

BEE CENTSIBLE

Michigan Department of Educa
Food and Nutrition Program
Lansing, MI 48909
1979

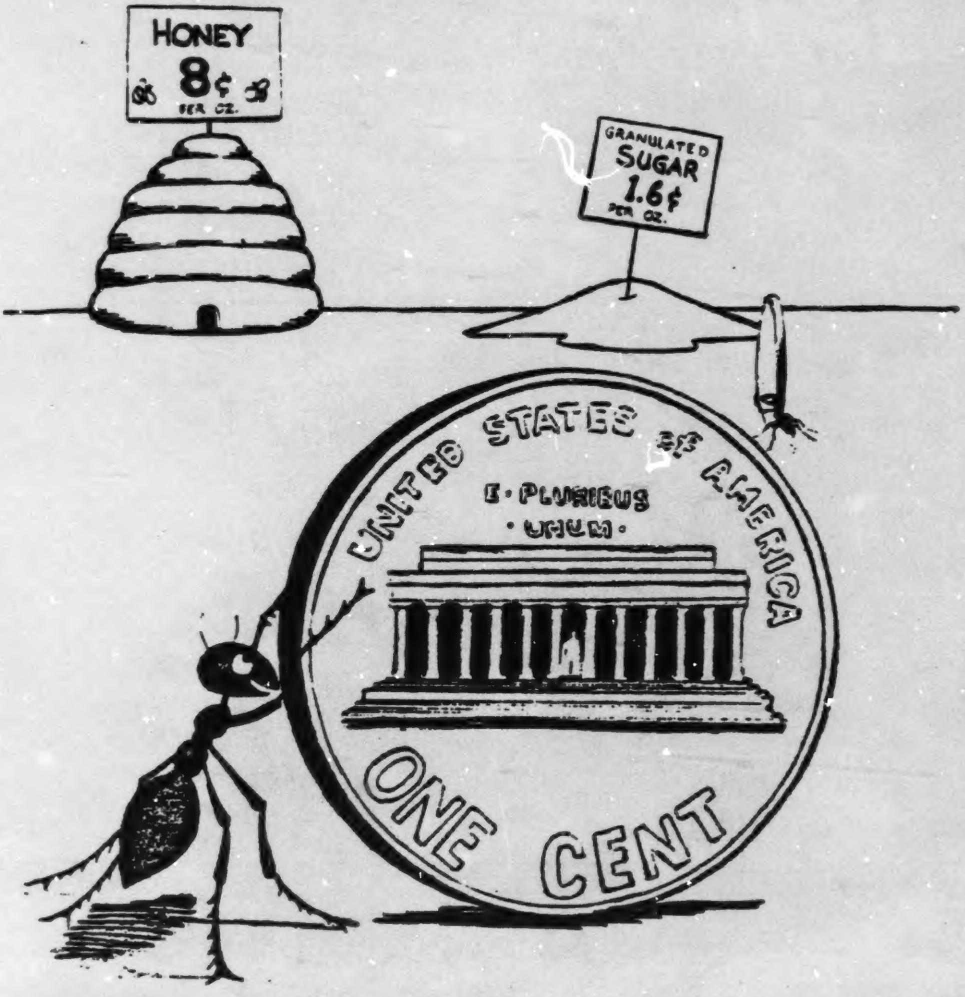
When choosing a sweetener, remember that using a sweetener as a source of nutrients other than calories does not make "cents." For an economical choice, refer to the sweetener chart below.



Product	Calories Per Tbs.	Grams Carbohydrate	Grams Protein	Mgms. Sodium	Mgms. Calcium	Mgms. Phosphorus	Mgms. Potassium	Mgms. Magnesium	Mgms Iron	Mgms. Thiamin	Mgms. Riboflavin	Mgms. Niacin	Mgms. Ascor/ Acid	Cost Per Ounce
Granulated Sugar	46	11.9		trace		trace			trace					1.6¢
Powdered Sugar	31	8.0		trace		trace			trace					2.9¢
Brown Sugar Unpacked	34	8.75	0	2.8	8.7	1.8	31.2		.3	trace	trace	.18		2.9¢
Brown Sugar Packed	51	13.4	0	4.1	13.3	2.6	47.3		.5	trace	trace	.25		2.9¢
Crude (raw) Brown Sugar	51	12.9	trace		7.3	6.3			.6	2.9	15.7	trace	trace	5.0¢
Maple Sugar Candy(1¼x1x½)	piece 52	13.5			27	2			.5					39.0¢
Corn Syrup	59	15.4			9	3	1		.8		0	0	0	4.4¢
Honey	64	17.3	0.1	1	1	1	11		.1	trace	.0	0.1	trace	8.0¢
Maple Syrup	50	12.8		2	20	2	35		.2					14.9¢
Imitation Maple Syrup	50	12.8		trace	3	trace	5		trace					5.3¢
Molasses	46	12.0		7	58	14	213		1.2		.02	.2		7.6¢

Values from Bowes & Church, 12th Edition. Food Values of Portions Commonly Used and from 13th Edition, J.B. Lippincott Co.

The price paid for so-called "natural" or "health food sweeteners" is not economical. For example, crude or unrefined brown sugar, usually only available in health food stores, is twice as expensive as brown sugar. There are more nutrients in crude brown sugar, but the amounts are so minute that crude brown sugar would not be a wise, economical choice.


HONEY
8¢
PER OZ.
GRANULATED
SUGAR
1.6¢
PER OZ.
UNITED STATES OF AMERICA
E·PLURIBUS
·UNUM·
ONE CENT

LESSON 11

PROGRESS TEST FOR LESSONS 6-10

A. Goal of this lesson

The goal of this lesson is to review the most important aspects of the past five lessons by administering the following progress test.

B. Purpose of this lesson

After completing this test, the participants should be able to:

1. summarize and review the information in lessons 6-10,
2. emphasize the most important points presented in lessons 6-10, and
3. identify subject areas in which further study is needed or desired.

NOTE: There is no minimum score for success on this test. It is a learning activity just as the other lessons have been.

C. Instructor preparation for class progress test

1. The time allowed for this lesson is approximately 25 minutes.
2. Duplicate sufficient copies of Progress Test.
3. The Progress Test should be given in the following manner.
    a. Pass out copies of the progress test to each participant.
    b. Provide pens or pencils for those who may not have brought their own.
    c. Explain that the reason for this Progress Test is to review the important information presented in the past five lessons.
    d. Briefly go through the test together to explain the different kinds of questions to be sure that all participants know what they need to do for each question.

e. Allow approximately 25 minutes for participants to complete the test.

f. Allow participants to keep their own test while answers are discussed.

g. State aloud which answer(s) are correct for each question.

h. Discuss how to change false statements so they read "true."

i. Lead a class discussion relating to reasons why other choices, if given, are incorrect. Ask participants to give examples of the application of each question to their school food service situation.

j. Allow any participants who desire to do so to retake the test on their own time.

k. Provide additional references on any topic to participants who desire further information.

LESSON 11

Progress Test for Lessons 6-10

MULTIPLE CHOICE: Select the one best answer.

1. Which of the following are fat-soluble vitamins?

   a. Vitamin D and vitamin C
   b. Vitamin B_{12} and vitamin K
   c. Vitamin A and vitamin E
   d. Vitamin B_6 and vitamin A

2. Water-soluble vitamins are generally ______________________.

   a. stored in the body
   b. not excreted by the urine
   c. not stored significantly by the body
   d. only excreted when taken in excessive amounts

3. Vitamin A is added to some foods such as ______________________.

   a. margarine
   b. cereals
   c. canned vegetables
   d. baked goods

4. The intended use of the U.S. RDAs (U.S. Recommended Dietary Allowances) is for______________________.

   a. planning a special diet for an obese child
   b. a guide to meal planning
   c. evaluating individual nutrient intake
   d. labeling information on food

5. The term "enrichment" refers to______________________________.

   a. addition of fats to a product to make it richer
   b. optional ingredients added to foods to improve quality
   c. additives and preservatives
   d. nutrients added to foods as required by law

6. A strict vegetarian diet may be deficient in _______________.

a. vitamin E
b. vitamin B_{12}
c. potassium
d. vitamin C

7. Which of the following will aid in retaining nutrients in food preparation?

a. using long, slow cooking methods
b. cooking large amounts at a time
c. cooking as large pieces as possible
d. adding baking soda to vegetables

8. "Trace minerals" are the nutrients which are ______________________.

a. lost in cooking and therefore in short supply
b. needed in very small amounts in the body
c. not significant in the diet
d. not known to be used by the body

9. MATCHING: Match the following nutrients with their functions or descriptions. Only one answer per blank; use each function only once.

_____ Vitamin A
_____ Vitamin D
_____ Vitamin E
_____ Vitamin K
_____ Vitamin C
_____ B-vitamins
_____ Vitamin B_{12}
_____ Calcium
_____ Iron
_____ Iodine
_____ Sodium
_____ Fluoride

a. Assists in the formation of blood clots
b. Prevents a deficiency disease called rickets
c. Use of energy from the energy nutrients
d. Carries oxygen and carbon dioxide in the blood
e. Aids in prevention of dental cavities
f. Provides rigidity to bones and teeth
g. Maintains correct amount of water on the inside and outside of cells
h. Improves vision at night
i. Often fortifies table salt
j. Protects vitamins A and C from oxidation
k. Formation of red blood cells and nerves
l. Aids in wound healing and resisting infection

FILL IN THE BLANK

10. Identify a major food source for each of the following nutrients:

Vitamin A

Vitamin D

Vitamin B_{12}

Vitamin C

Calcium

Iron

11. Describe 4 ways to prevent vitamin losses during preparation or storage of foods.

1.

2.

3.

4.

TRUE-FALSE:

12. T F Vitamins are generally not made by the body, but are provided by foods.
13. T F Recommended Dietary Allowances (RDAs) are exact amounts of nutrients needed by all healthy individuals.
14. T F Vitamin E is sometimes used commercially as a preservative in fats and oils.
15. T F The refinement process of whole grains results in a loss of niacin and thiamin.
16. T F Deficiency of vitamin B_{12} leads to scurvy.
17. T F Keeping vegetables soaking in water helps to prevent vitamin losses.
18. T F Commercially canned vegetables need to be cooked before serving.
19. T F Iron deficiency anemia is the most common nutrient deficiency in the U.S.A.
20. T F Dietary guidelines state that Americans should eat more salt.
21. T F Water is necessary to regulate body temperature.

FILL IN THE BLANK:

22. Name 2 diseases in which obesity may play a part, either in the course of or in the occurrence of the disease.

    1.
    2.

23. What are the two main factors to control when attempting to lose weight?

    1.
    2.

24. Suggest two ways to gain weight.

    1.
    2.

25. What is a food additive?

26. Discuss the role of sugar in the diet. Should it be included or not? What do you think? Support your reasons.

27. Give three examples of foods high in sodium.

1.

2.

3.

28. Does an athlete need to eat more protein than other people? Support your position.

29. What would you tell someone who asked you if they should take vitamin supplements based on the Dietary Guidelines? (Assume the person is healthy and normal)

30. Name 3 preventive measures for dental disease.

1.

2.

3.

31. What kinds of foods are most likely to promote tooth decay?

32. What are some protein sources for the lacto-ovo vegetarian (name at least 4)?

1.
2.
3.
4.

33. What 2 vitamins may be deficient in the pure vegetarian diet?

1.
2.

Possible Score __________ Actual Score __________

ANSWER SHEET FOR PROGRESS TEST - LESSON 11

MULTIPLE CHOICE: 1-c, 2-c, 3-a, 4-d, 5-d, 6-b, 7-c, 8-b.

9. MATCHING: Vitamin A - h, Vitamin D - b, Vitamin E - j, Vitamin K - a, Vitamin C - a, B-vitamins - c, B_{12} - k, Calcium - f, Iron - d, Iodine - i. Sodium - g, Fluoride - e.

10. COMPLETION: Identify a major source of each of the following nutrients.

Vitamin A: organ meats, dark green or yellow vegetables, eggs, butter, milk
Vitamin D: fortified milk, egg yolks
Vitamin B_{12}: animal products
Vitamin C: pepper, spinach, asparagus, broccoli, brussel sprouts, peas
Calcium: milk and milk products, dark green vegetables

Iron: red meats, liver, dark green vegetables

11. Describe 5 ways to prevent vitamin losses during preparation and storage of foods.

    1. Cook vegetables in small amounts of water.
    2. Cook whole or in large pieces.
    3. Cook or heat vegetables in shortest time possible; stagger batch cooking.
    4. Store in closed container in cool, dry area.
    5. Mark produce and cans - first in, first out.
    6. Steam vegetables.

TRUE/FALSE: 12-T, 13-F, 14-F, 15-T, 16-F, 17-F, 18-F, 19-T, 20-F, 21-T.

QUESTIONS ON SPECIAL TOPICS:

22. Diabetes, coronary heart disease, high blood pressure.
23. Calories taken in (food, alcohol); calories used up (as in exercise).
24. Increase quantity of foods eaten or increase caloric intake; less exercise.
25. A substance added to foods either intentionally or accidentally.
26. Answers will vary according to point of view. Refer to lesson 10.
27. Pickles, condiments, potato chips, cured meats, sauerkraut, olives.

28. No. Supporting arguments will vary.

29. Generally supplements are not needed if a balanced diet is eaten.

30. Good diet during pregnancy; good diet during infancy and childhood; brushing and flossing regularly; avoid snacking (especially of sweets and sticky foods); regular visits to dentist; fluoridation of local water supplies.

31. Carbohydrates, especially foods that will stick to the teeth and sucrose containing.

32. Legumes, eggs, milk, nuts, seeds, whole grains, peanut butter.

33. Vitamin B_{12}; vitamin D.

Possible Score ____________________

Appendix 1

NUTRITION KNOWLEDGE TEST

The Nutrition Knowledge Test was developed in 1978-79 to test the general nutrition knowledge of Michigan teachers.

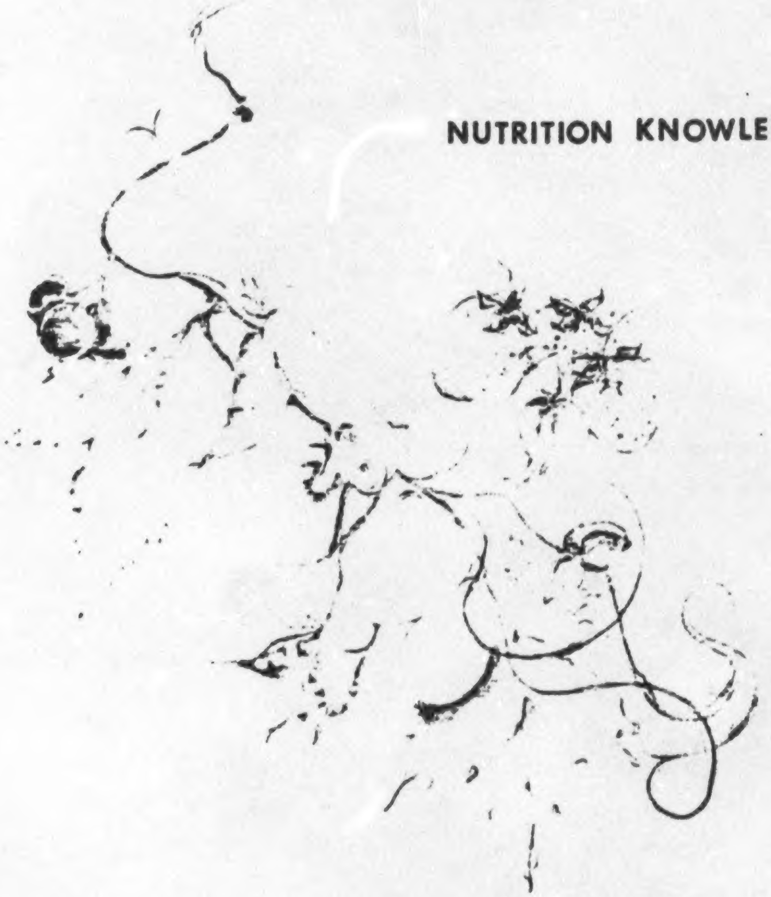
In 1978-79 they averaged 50% on the test before inservice training. They also improved after nutrition inservice training.

Many people who conduct inservice education for school food service workers also have used the test. They report similar results to the teachers, about 50% before inservice and a very large improvement after the class.

If you have any questions about the test contact Dr. Kathryn Kolasa, Associate Professor, Food Science and Human Nutrition, Michigan State University, East Lansing, MI 48824. (527) 353-1669.

APPENDIX 2

NKT



NUTRITION KNOWLEDGE TEST

Directions

This Booklet consists of True-False and Multiple Choice items. With a No. 2 pencil, blacken the circle immediately to the left of the response you choose. DO NOT USE ink, ballpoint or felt tip pens.

Items 1 - 12 are either true or false. If a statement is true, fill in the circle immediately to the left of "TRUE." If the statement is false, fill in the circle immediately to the left of "FALSE."

Items 13 - 40 are multiple choice. Choose the best answer from the alternatives provided. Fill in the circle immediately to the left of the answer you have selected.

IT IS IMPORTANT THAT YOU ANSWER ALL QUESTIONS EVEN IF YOU ARE NOT SURE OF YOUR ANSWERS.

Fill in circles completely and erase totally any answer you wish to change

AGAIN, USE A NO. 2 LEAD PENCIL TO BLACKEN THE CIRCLE IMMEDIATELY TO THE LEFT OF THE RESPONSE YOU CHOOSE. DO NOT USE INK, BALLPOINT OR FELT-TIP PENS.

MSU-NET
FSHN/80

True-False

Answer the following questions by filling in the circle to the **left** of either "true" or "false."

1. All nutrients are chemicals.
○ True ○ False

2. Vitamin E eaten or taken as a supplement beyond the body's requirements is stored in the body.
○ True ○ False

3. An ounce of carbohydrate has more calories than an ounce of protein.
○ True ○ False

4. Minerals provide the body with small amounts of calories.
○ True ○ False

5. Some foods by themselves have all the nutrients in the amounts needed for adequate growth and health.
○ True ○ False

6. The teenage habit of snacking can provide valuable nutrients.
○ True ○ False

7. Pesticides and other pollutants are incidental food additives.
○ True ○ False

8. Vitamin A is toxic when consumed in large quantities.
○ True ○ False

9. As a person ages, generally, energy needs are reduced while nutrient needs remain the same.
○ True ○ False

10. If a child refuses milk, an acceptable food to provide similar nutrients would be eggs.
○ True ○ False

11. Nutrition labels are required on all canned goods.
○ True ○ False

12. There are no known dietary cures for diseases such as diabetes and heart disease.
○ True ○ False

Multiple Choice

Answer the following questions by filling in the circle to the **left** of the four answers.

13. Decreasing caloric intake by 500 calories per day would mean a loss of about one pound of body fat in
○ 2 days ○ 10 days
○ 7 days ○ 14 days

14. Which of the following is a vitamin?
○ fluoride ○ fructose
○ folacin ○ iron

15. The RDA's (Recommended Dietary Allowances) are nutrient levels
○ used as guidelines for diet planning
○ which insure good health for all individuals
○ which represent minimum daily needs
○ all of the above

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SHEET NUMBER
⓪①②③④⑤⑥⑦⑧⑨
⓪①②③④⑤⑥⑦⑧⑨
⓪①②③④⑤⑥⑦⑧⑨

MSU-NET
FSHN/80

16. Weight gain results, if at all, when calorie intake
- ○ is from high fat foods
- ○ is from high sugar content foods
- ○ is more than calorie expenditure
- ○ all of the above

17. Of the following, the best food source of both vitamin A and vitamin C is
- ○ apple ○ broccoli
- ○ apricot ○ carrot

18. Which of the following is the best food source of calcium?
- ○ butter ○ tomato juice
- ○ kelp ○ yogurt

19. The most concentrated source of calories is
- ○ fat ○ starch
- ○ protein ○ sugar

20. One of the first symptoms of vitamin A deficiency is
- ○ anemia ○ night blindness
- ○ jaundice ○ scurvy

21. The fat soluble vitamins include
- ○ A, B_1, B_{12} and D
- ○ A, C, D, and E
- ○ A, D, E and K
- ○ B_1, B_6, B_{12}, and C

22. Vitamins are
- ○ a source of energy
- ○ indestructable
- ○ inorganic compounds
- ○ organic compounds

23. Which vitamin can be made in the body when sun rays contact the skin?
- ○ A ○ C
- ○ B_{12} ○ D

24. The chief function of carbohydrate we eat is to
- ○ maintain body fat
- ○ provide energy
- ○ provide essential amino acids
- ○ transport vitamin A

25. Sodium, found in table salt and in food
- ○ can be deactivated by chloride
- ○ helps maintain water balance
- ○ helps prevent scurvy
- ○ is a non-essential nutrient

26. Enriched foods have nutrients
- ○ added that were not originally present or not present in the quantity added
- ○ replaced that were removed during processing
- ○ that are chemically inferior to the natural ones present in the food
- ○ that are chemically superior to the natural ones present in the food

27. If the cream is skimmed from milk, which nutrient will be reduced unless it is added back after processing?
- ○ calcium ○ vitamin B_{12}
- ○ vitamin A ○ vitamin C

SHEET NUMBER

MSU–NET
FSHN/80

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28. According to the Daily Food Guide it is recommended that children and adults have how many servings of fruit and/or vegetables per day?

○ 1 ○ 3
○ 2 ○ 4

29. People with hypertension may need to reduce their intake of

○ alcohol ○ sodium
○ potassium ○ sugar

30. Peanut butter belongs to which of the Daily Food Guide groups?

○ breads and cereals ○ meat
○ fruits and vegetables ○ milk and dairy products

31. Eggs belong to which of the Daily Food Guide groups?

○ breads and cereals ○ meat
○ fruits and vegetables ○ milk and dairy products

32. A child's lunch should supply how much of his nutritional needs for a day?

○ 25% ○ 45%
○ 33% ○ 50%

33. According to the Daily Food Guide, it is recommended that teenagers have how many servings from the milk group per day?

○ 2 ○ 4
○ 3 ○ 5

34. According to the Daily Food Guide it is recommended that children and adults have how many servings of meat or protein per day?

○ 1 ○ 3
○ 2 ○ 4

35. During pregnancy, most women (age 23 and above) should

○ increase their food intake by 300 calories per day
○ limit their weight gain to 15-20 pounds
○ restrict their sodium intake
○ take mega vitamin supplements

36. Which of the following food combinations would provide a complete protein?

○ beans and lentils ○ rice and beans
○ corn and wheat ○ rice and broccoli

37. Vegetarians who eat no animal products or fortified products may need to supplement their diets with

○ iron ○ vitamin A
○ magnesium ○ vitamin B_{12}

38. Labeling laws require that food product ingredients be listed on the container in descending order of their

○ calories ○ nutrients
○ cost ○ weight

39. Vitamin C found in an orange is chemically

○ identical but more nutritious than vitamin C made in a lab
○ identical to vitamin C made in a lab
○ inferior to vitamin C made in a lab
○ superior to vitamin C made in a lab

40. If a food additive is found to cause cancer in a laboratory rat, the FDA must, under the Delaney Clause of The Additive Amendment of 1958,

○ ban the use of that additive
○ establish an allowable level for food additives
○ order investigative hearings
○ order lab testing in humans

THANK YOU FOR COMPLETING THE NUTRITION KNOWLEDGE TEST

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Nutrition Education and Training
Food Science and Human Nutrition
1979

MSU-NET
FSHN/80

Michigan State University Printing

NKT ANSWER KEY

True - False

1. T
2. T
3. F
4. F
5. F
6. T
7. T
8. T
9. T
10. F
11. F
12. T

MULTIPLE CHOICE

13. 7 days
14. Folacin
15. Used as guidelines for diet planning
16. Is more than calorie expenditure
17. Broccoli
18. Yogurt
19. Fat
20. Night blindness
21. A,D,E, and K
22. Organic compounds
23. Vitamin D
24. Provide energy
25. Helps maintain water balance
26. Replaced that were removed during processing
27. Vitamin A
28. 4
29. Sodium
30. Meat group
31. Meat group
32. 33%
33. 4
34. 2
35. Increase their food intake by 300 calories per day
36. Rice and beans
37. Vitamin B_{12}
38. Weighy
39. Identical to vitamin C made in a lab
40. Ban the use of that additive

Appendix 3

List of Publishing Houses

Burgess Publishing Co.
7108 Ohms Lane
Minneapolis, MN 55435

Follett Publishing Co.
Association Press
1010 W. Washington Blvd.
Chicago, IL 60607

Food and Nutrition Information and
Education Resource Center (FNIERC)
National Agricultural Library Bldg.
Room 304
Beltsville, MD 20705

Holt, Rinehart & Winston, Inc.
383 Madison Ave.
New York, NY 10017

Institute of Food Technologists (IFT)
Suite 2120
221 N. LaSalle St.
Chicago, IL 60601
(312) 782-8424

Lending Service is now limited. You may be able to borrow from FNIC through your Cooperative Extension Service Office.

Lippincott/Harper
Health Professions Publications
E. Washington Square
Philadelphia, PA 19105

Macmillan Publishing Co.
Front & Brown St.
Riverside, NJ 08370

Michigan Department of Public Health
Bureau of Personal Health Services
3500 N. Logan St.
Lansing, MI 48909

Michigan State University
Cooperative Extension Service
Bulletin Office
East Lansing, MI 28824

C. V. Mosby Co.
11830 Westline Industrial Drive
St. Louis, MO 63141
(800) 325-4177

National Audiovisual Center
National Archives & Records Service
General Services, Administration
Washington, D.C. 20409
(301) 763-1896

Nutrition Foundation, Inc.
Office of Education and Public Affairs
888 Seventeenth St.
Washington, D.C. 20006
(202) 872-

Nutrition Today Society
P.O. Box 1829
Annapolis, MD 21404

Office of Publications
National Academy of Sciences
National Research Council
2101 Constitution Ave.
Washington, D.C. 20418
(202) 389-6731

Prentice-Hall, Inc.
College Operations Department
Englewood Cliffs, NJ 07632

W. B. Saunders Co.
W. Washington Square
Philadelphia, PA 19105

Society for Nutrition Education
2140 Shattuck Ave.
Suite 1110
Berkeley, CA 94704
(415) 548-1363

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402
(202) 783-3238

West Publishing Co.
50 W. Kellogg Blvd.
P.O. Box 3526
St. Paul, MN 55165
(612) 228-2500

J. Weston Walch Publishers
Box 658
Portland, Maine 04104
(800) 341-6094

John Wiley & Sons, Inc.
605 Third Avenue
New York, NY 10158

APPENDIX 4

OTHER MANUALS IN THIS SERIES INCLUDE:

FOOD PREPARATION MANUAL
FOODSERVICE REGULATION MANUAL (HISTORY & LEGISLATION)
MENU PLANNING
MERCHANDISING MANUAL
NUTRITION EDUCATION
NUTRITION MANUAL
PERSONNEL MANAGEMENT
COST CONTROL

For Information on Manuals or Updates contact:

Michigan Department of Education
Food and Nutrition Program
School Management Services
P.O. Box 30008
Lansing, MI 48909
(517) 373-3347